



Soldiers On Point for the Nation



Persuasive in Peace, Invincible in War

Army Modernization

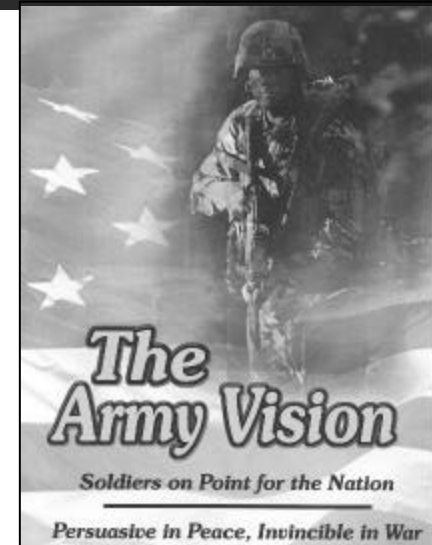
NDIA Munitions Executive Summit

13 February 01



The Army Vision

- **People**
 - Centerpiece of our formations
 - Train Soldiers and grow leaders
 - Leadership is our stock-in-trade
 - Well Being -- investment in Nation's security -- providing for soldiers, civilians, veterans, and their families
- **Readiness**
 - Top priority
 - Must maintain non-negotiable contract -- to fight and win the Nation's wars as we transform
 - Support National Military Strategy -- meet JSCP and CINC requirements
- **Transformation**
 - More strategically responsive and dominant at every point on the spectrum of military operations

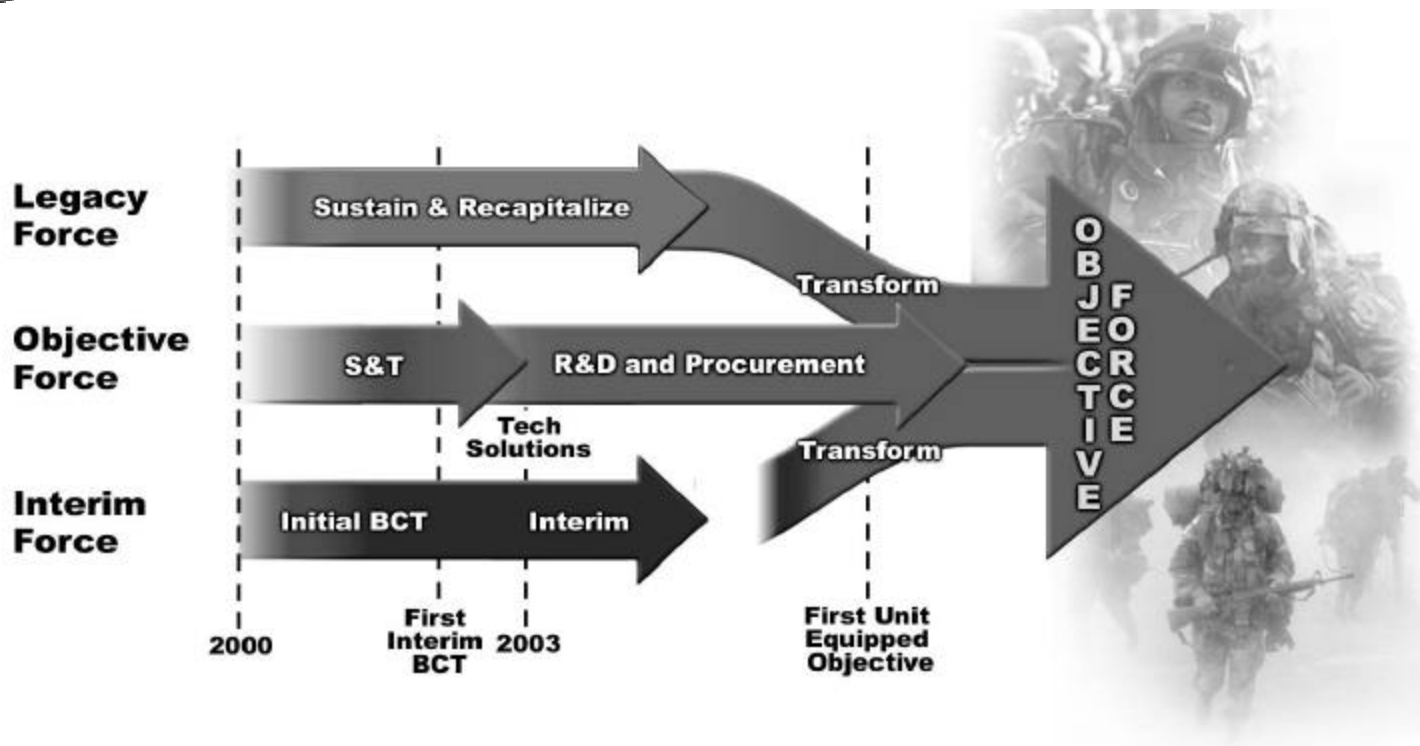


An Army of One



The Army Transformation

The Three Vectors



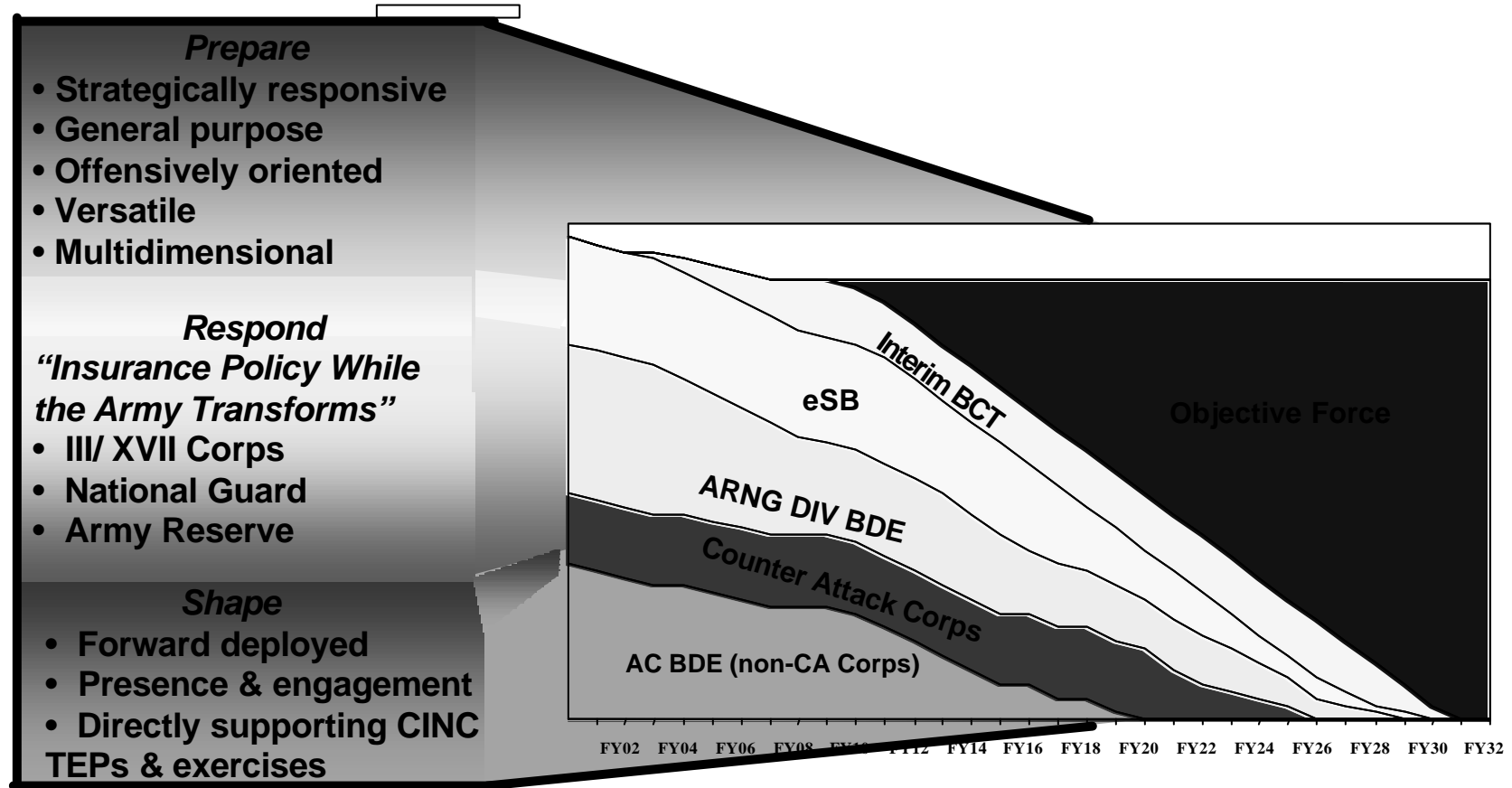
*... Responsive, Deployable, Agile, Versatile,
Lethal, Survivable, Sustainable.*

An Army of One



Army Transformation

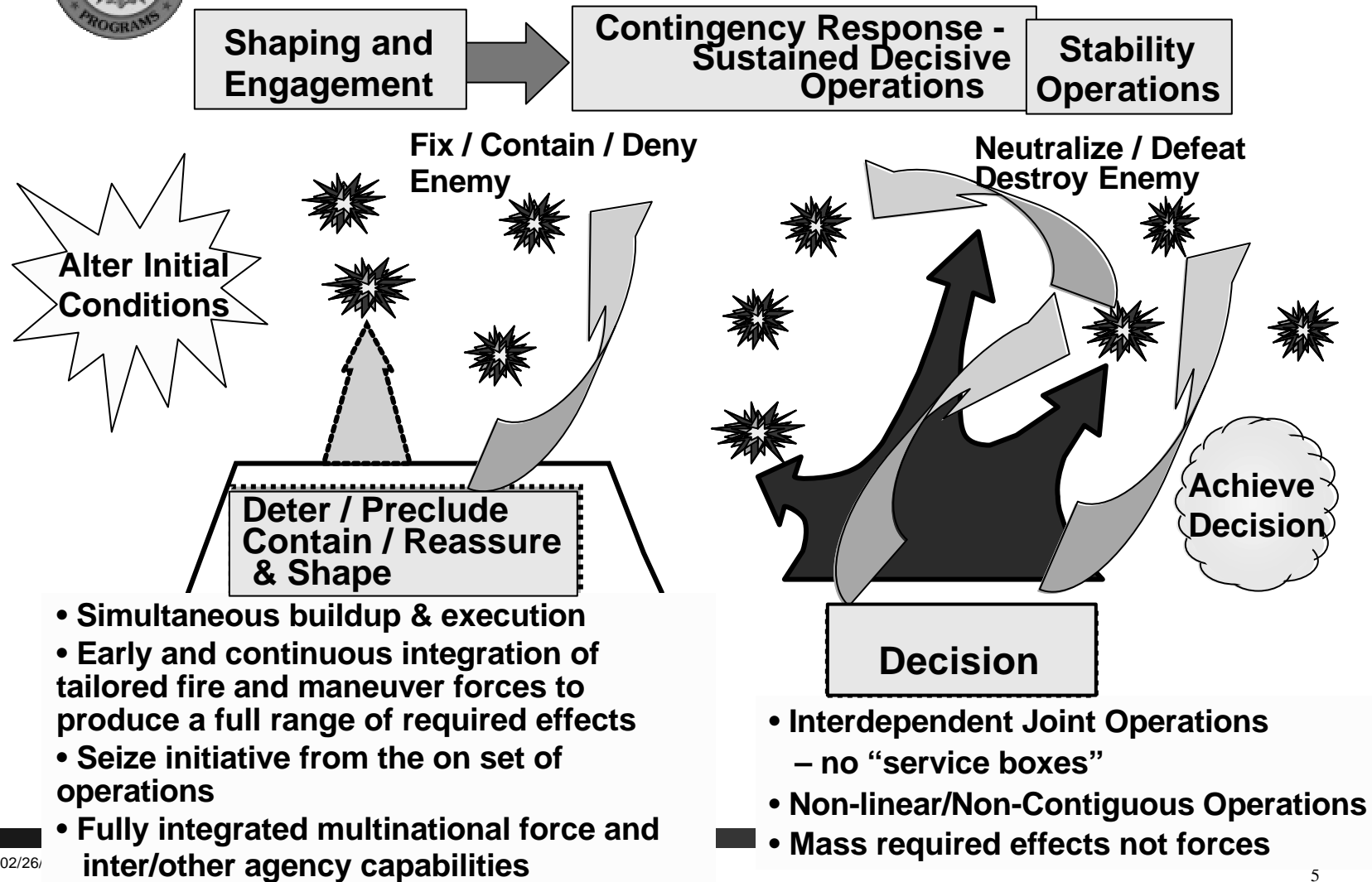
SUPPORTING THE NATIONAL MILITARY STRATEGY



An Army of One



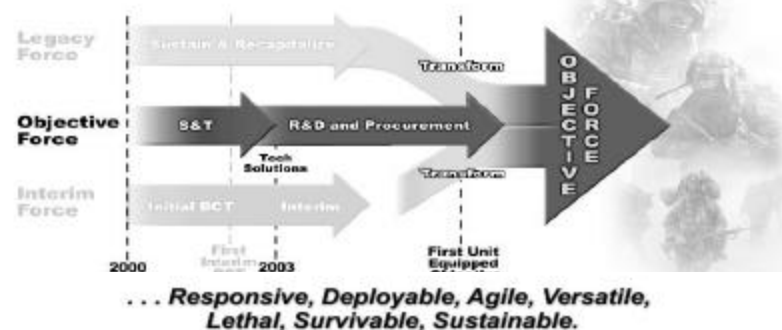
The Future Fight





Objective Force

- Force that is strategically responsive and dominant at every point on the spectrum of military operations.
- Provides NCA with an increased range of options for regional engagement, crisis response, and sustained land force operations.
- Capable of rapid transition across mission requirements without loss of momentum.
- 96% of all investment in S&T is to meet Objective Force Requirements.
- Transforming The Army to the Objective Force is a 30 year process.



- Responsive:** the ability to put forces where needed on the ground.
- Deployable:** capable of rapid strategic movement.
- Agile:** the ability to shift seamlessly between military operations.
- Versatile:** adaptive to changing situations with utility across the spectrum.
- Lethal:** the overwhelming ability to win through the application of force.
- Survivable:** measures to protect the force in combat and against asymmetric threats.
- Sustainable:** the capability to continue operations longer than any adversary.

An Army of One



The Objective Force

What it Provides to the Warfighter

**An increase in
strategic
responsiveness and
full spectrum
dominance**

- BCT in 96 hrs; Div in 120 hrs; 5 Div in 30 days
- BCT fights immediately upon arrival
- Simultaneous air and sea lift
- Strategic responsiveness...evolving Army Prepo Stocks

**Greater lethality
and survivability
using advanced
technologies**

PRECISION

- ✓ Precise target location
- ✓ Inside enemy dwell time
- ✓ One meter accuracy

KNOWLEDGE

- ✓ See with greater clarity
- ✓ Every attack deliberate
- ✓ Every engagement an ambush

STEALTH

- ✓ Maneuver with lower profile
- ✓ Less probability of combat loss

The Objective Force ...*The Army of Tomorrow*

An Army of One



Army Science and Technology

- 96% of the \$8.5B POM S&T funding supports the Objective Force (\$1.3B per year).
- Funds high-payoff Future Combat System (FCS) technologies.
- Developed collaborative program with DARPA for high risk solutions.
- Army Science Board assessment supports 2006 FCS development decision.
- Established clear decision points.
- Strongly supported by Congress.

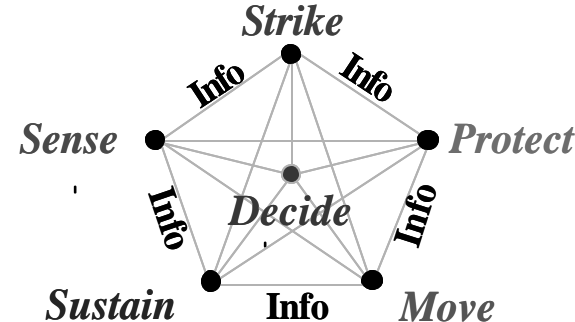
Today



- *Protect*
- *Sense*
- *Decide*
- *Move*
- *Strike*
- *Sustain*

In today's major weapons systems, the six key combat functions are built into the same platform

Tomorrow



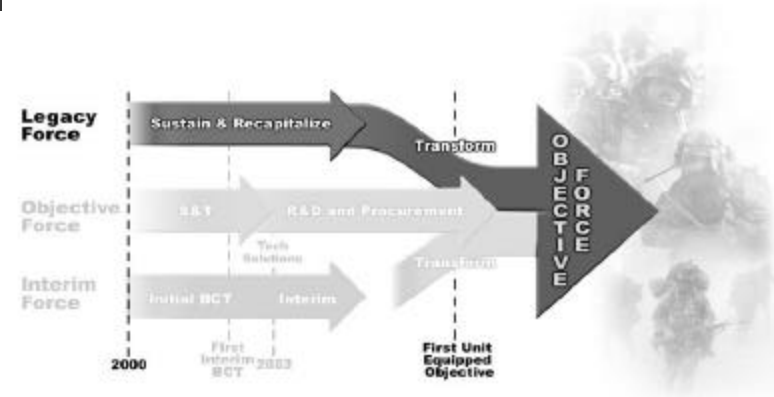
In the system of systems, the six key combat functions will be distributed across the battlefield in multiple platforms

An Army of One



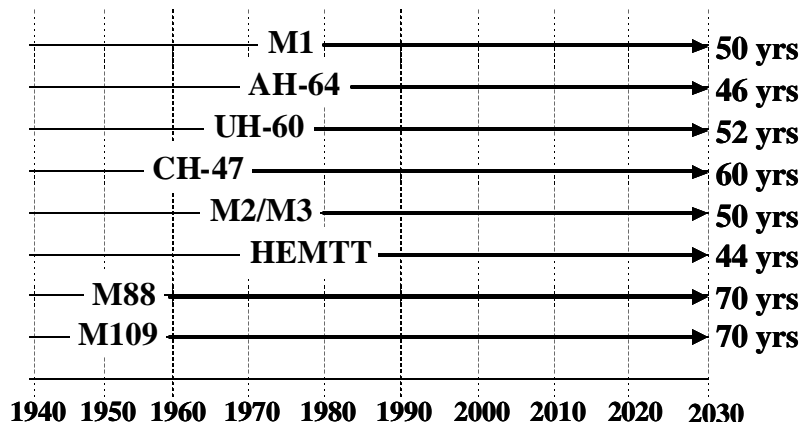
Legacy Force

- Guarantees winning our Nation's wars decisively.
- Recapitalization will rebuild and/or selectively upgrade 21 existing systems.
- Invests the *right amount* in order to provide more reliable and capable systems to meet warfighting requirements.
- Ensures combat overmatch while we transform over the next thirty years.
- Many systems will transition to the Objective Force.
- Operational shortfall exists to rapidly build requisite combat power to influence a potential crisis.



... Responsive, Deployable, Agile, Versatile, Lethal, Survivable, Sustainable.

Army System Life Cycles

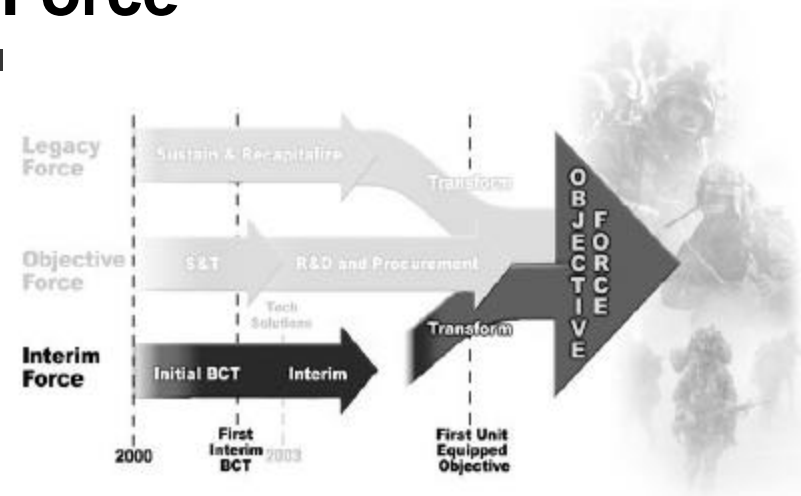


An Army of One

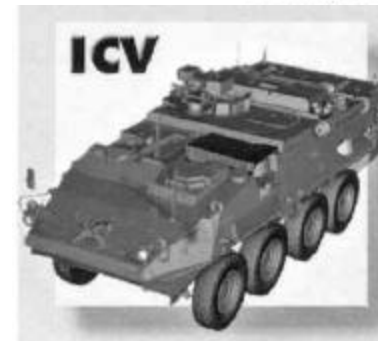


Interim Force

- Meets immediate requirement to provide CINCs increased warfighting capability.
- 6 of 8 required Interim Brigade Combat Teams (IBCT) currently funded.
- The IBCT is a rapidly deployable combat brigade task force.
- LAV-III selected as the Interim Armored Vehicle (IAV).
- Not an experimental force. Will be trained and ready to deploy.



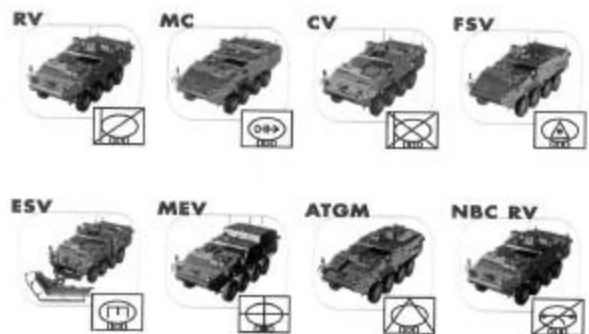
*... Responsive, Deployable, Agile, Versatile,
Lethal, Survivable, Sustainable.*



An Army of One



Interim Armored Vehicle



Infantry Carrier Vehicle

(ICV)

- LAV III Chassis
- 8x8 Wheeled w/CTIS & Run Flat
- High Hard Steel Structure
- Remote Weapon Station with cal .50 MG or MK19 40mm

Mobile Gun System

(MGS)

- LAV III Chassis
- Low Profile Turret
- M68A1 Cannon w/Autoloader
- Full Solution Fire Control

Brigade Configuration

	Qty Ea Bde	ORF	TDA	TOTAL
ICV	108	6	30	714
ATGM	9	1	15	75
MORTAR	36	2	13	241
RECON	48	3	12	318
FIRE SUPPORT	13	1	15	99
ENGR SQ VEH	9	1	13	73
CDR'S VEH	39	1	12	252
MED EVAC	17	1	10	118
NBC RECON	3	1	13	37
MGS	<u>27</u>	<u>4</u>	<u>18</u>	204
	309	21	151	
IBCTs	<u>x6</u>	<u>x6</u>		
TOTAL IAV	1854	126	151	2131

An Army of One



Modernization Strategy

Investment Strategy Definitions

Modernization: The development and/or procurement of new systems with improved warfighting capabilities

Legacy to Objective, Interim, Objective

Recapitalization: The rebuild and selected upgrade of currently fielded systems to ensure operational readiness and a zero time/zero mile system.

Rebuild - Restores system to a **like-new condition** in appearance, performance, and life expectancy; **inserts new technology** to improve reliability and maintainability

Selected Upgrade - **Rebuild** of system and adds warfighting capability **improvements to address capability shortcomings.**

✓ **Recapitalization is a cost effective alternative to buying new**

✓ **Costs are partially recovered through O&S cost avoidance**

✓ **Improves safety, supportability, readiness, and in some cases capabilities**

Legacy, Legacy to Objective

Maintain: **Repair or replacement** of end items, parts, assemblies, and subassemblies that wear or break. Includes: Organizational, intermediate, and depot maintenance.

Legacy, Legacy to Objective

With constrained resources, the goal is to invest the right amount in the Legacy Force in order to meet warfighting requirements.

An Army of One



Modernization Strategy

“Achieving Balance”



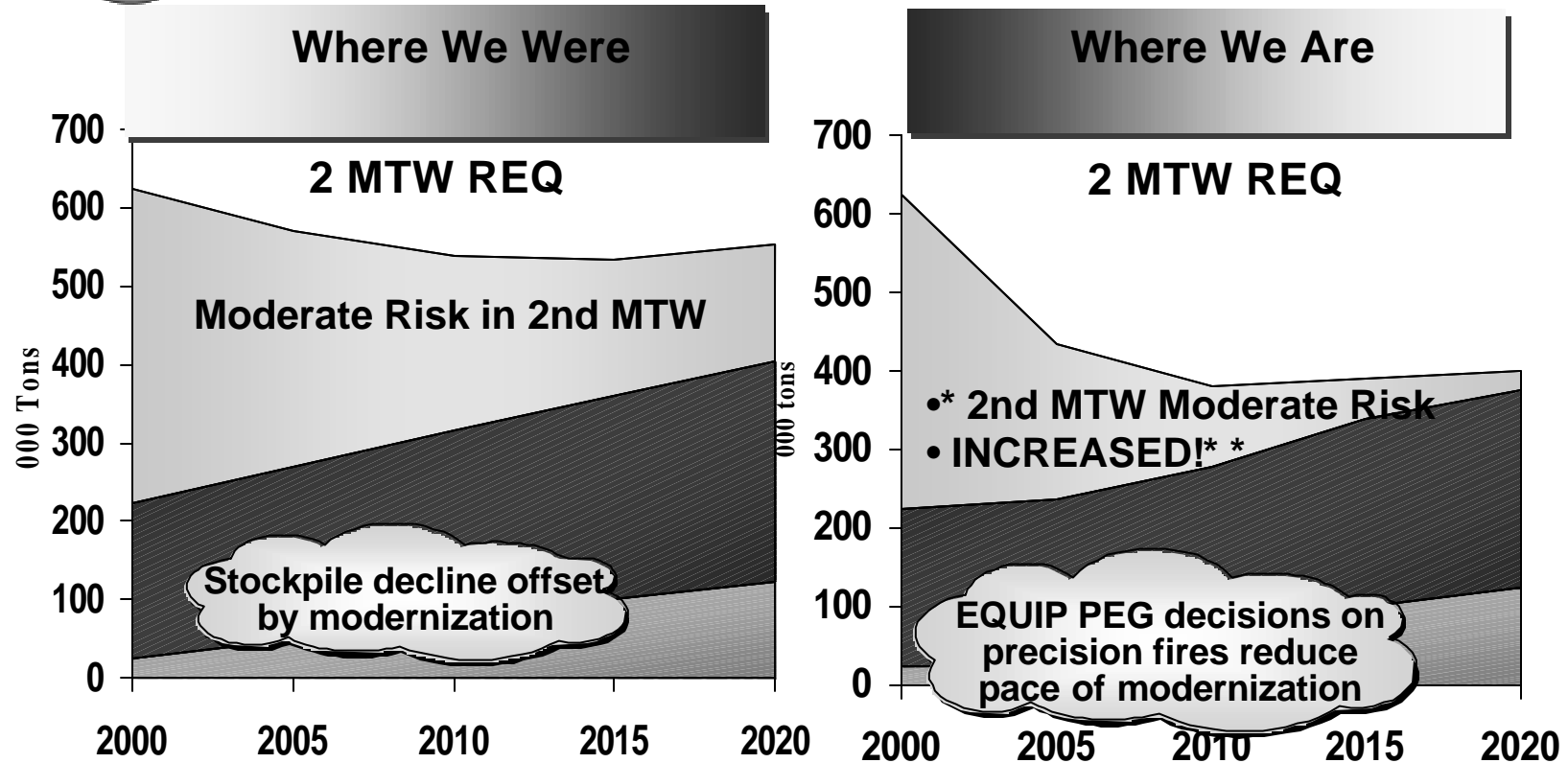
Force Development assists in balancing the process by:

- ✓ Recommending, reviewing studies & analyses
- ✓ Reviewing STOs
- ✓ Integrating Material Fielding across DTLOMS
- ✓ Supervising coordination of Total Package Fielding
- ✓ Working within Unit Set Fielding window
- ✓ Reviews requirements over system life-cycle

An Army of One



Army Munitions Assessment



SUSTAIN PEG removed PBD 751 Funds from stockpile mgmt - stockpile reliability declined





Ammo Shortfalls

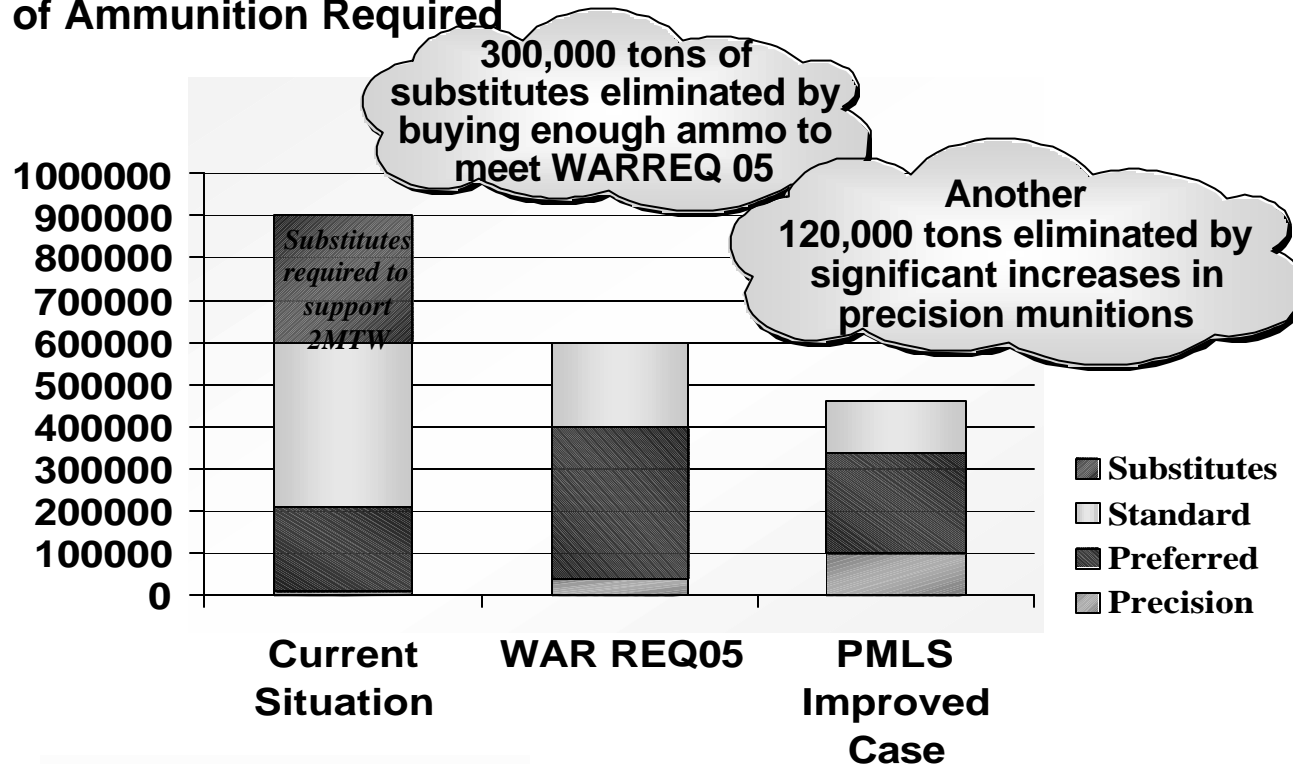
(FY02-07 Period)

- **Training Ammo - Approx. \$900M Shortfall**
 - Training historically fully resourced in budget year.
 - Out years are underfunded until they become budget years.
 - FY02 shortfall is approx. \$50M, due primarily to fact of life events.
- **Transformation Ammo - Approx. \$120M Shortfall**
 - This is deployment stocks (basic load & sustainment) of newer items that the Army is short, but provide the IBCTs with enhanced capabilities.
 - This averages out to approx. \$20M/yr, however executable programs will require larger buys in some years.
- **2 MTW Ammo - Approx. \$3B Executable Shortfall**
 - The full 2 MTW shortfall is approx. \$15B. However, approx. \$3B or \$500M/yr is executable without restructuring of the industrial base.
 - Acceleration of precision munitions during the period would reduce the number and quantity of the items needed, but not the cost.



Reducing Logistics Footprint

Tons of Ammunition Required



**\$14.8 Billion short of WARREQ05 -
Approx. \$2 billion in POM**

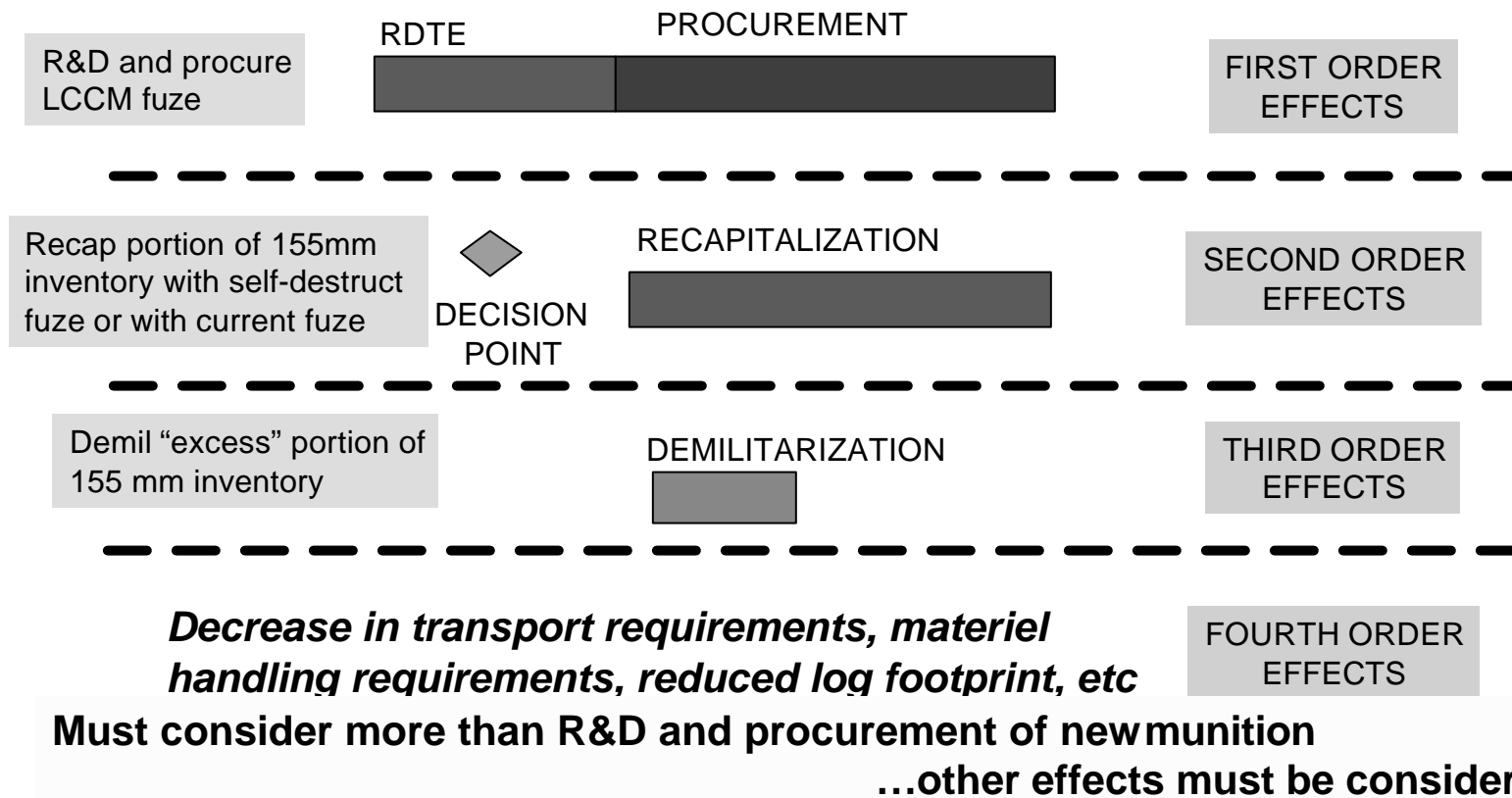
\$15 Billion add'l required for this capability

An Army of One



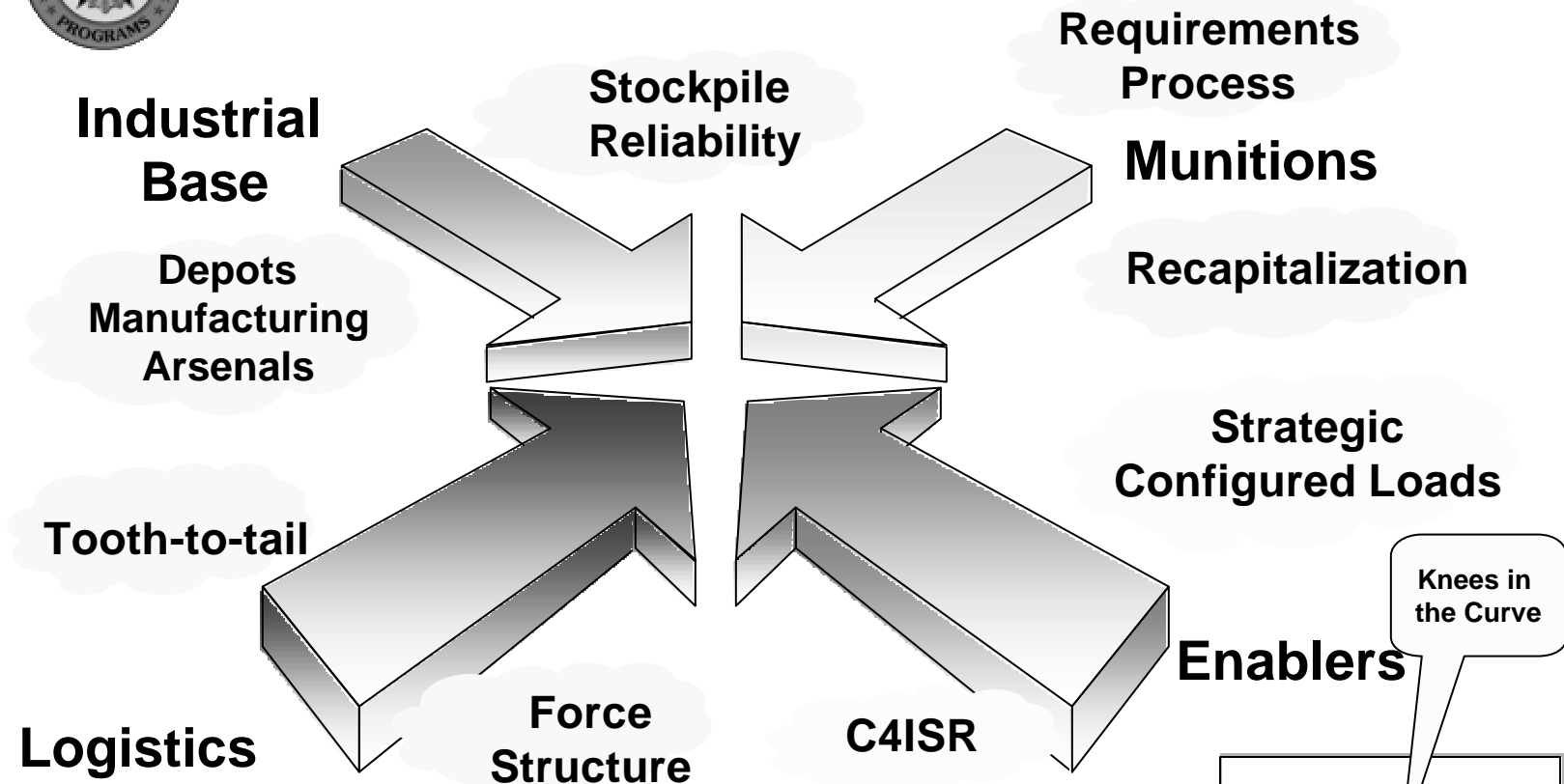
Investment Strategy Considerations

Illustrative example using Low Cost Competent Munitions...



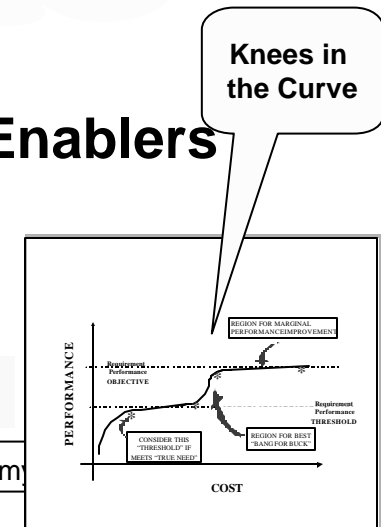


Complexity of Issue



Complex issue...cannot look at munitions in isolation

An Arm





Emerging Insights

- **We have capability shortfalls in smart/precision munitions for 5 to 40 km range band.**
- **Smart munitions decrease logistics requirements (less tonnage, fewer rounds fired, etc).**
- **Army must have ability to shape battlefield in all conditions to meet JTF and CINC requirements (i.e., timely and all weather needs).**
- **Joint interdependency opportunities expand as ranges from targets increase. This can provide trade space for munitions program decisions in support of transformation goals.**
- **Perspectives of PGM value varies with time and force employment concepts.**



Bottom Line

- The Army is Transforming into a more strategically responsive full-spectrum force.
- The 3 vector Transformation strategy is critical to shaping and responding today, while preparing for the future.
- Transforming The Army to the Objective Force is a 30-year process.
 - *Objective Force* – strategically responsive, deployable, agile, versatile, lethal, survivable, and sustainable.
 - *Legacy Force* – guarantees our ability to fight and win our Nation's wars decisively.
 - *Interim Force* – meets immediate requirement to provide CINCs increased warfighting capability.
- Munitions evolution will follow Transformation
 - Significantly improve lethality (blur NLOS/LOS)
 - Retain required current capability
 - Improve now with Off The Shelf availability



Additional Information

**MG Bill Bond
Director, Force Development
Deputy Chief of Staff for Programs
(703) 697-5116**

**Slides will be posted Friday and available at
*www.ado.army.mil***



BACKUP

Army and Joint Force PGM Requirements Redundancy



(IBCT and Obj Force)

Redundancy with Joint Force PGM Capabilities

High Redundancy

< 40KM

Highly responsive Army PGM capabilities to defeat armor and artillery

Direct

Javelin
Predator
LOSAT
Hellfire/Longbow
FOTT

Indirect

ERGM
LCCM
Excalibur
PGMM
SADARM (Marginal)
MSTAR

Selective Redundancy

> 40KM and < 150KM

Responsive Army PGM capabilities to defeat short dwell High Value targets

Hellfire/Longbow
Maverick
MLRS-ERR
MSTAR
CEMs
ATACMS IIA LOCAAS

Little Redundancy

> 150KM

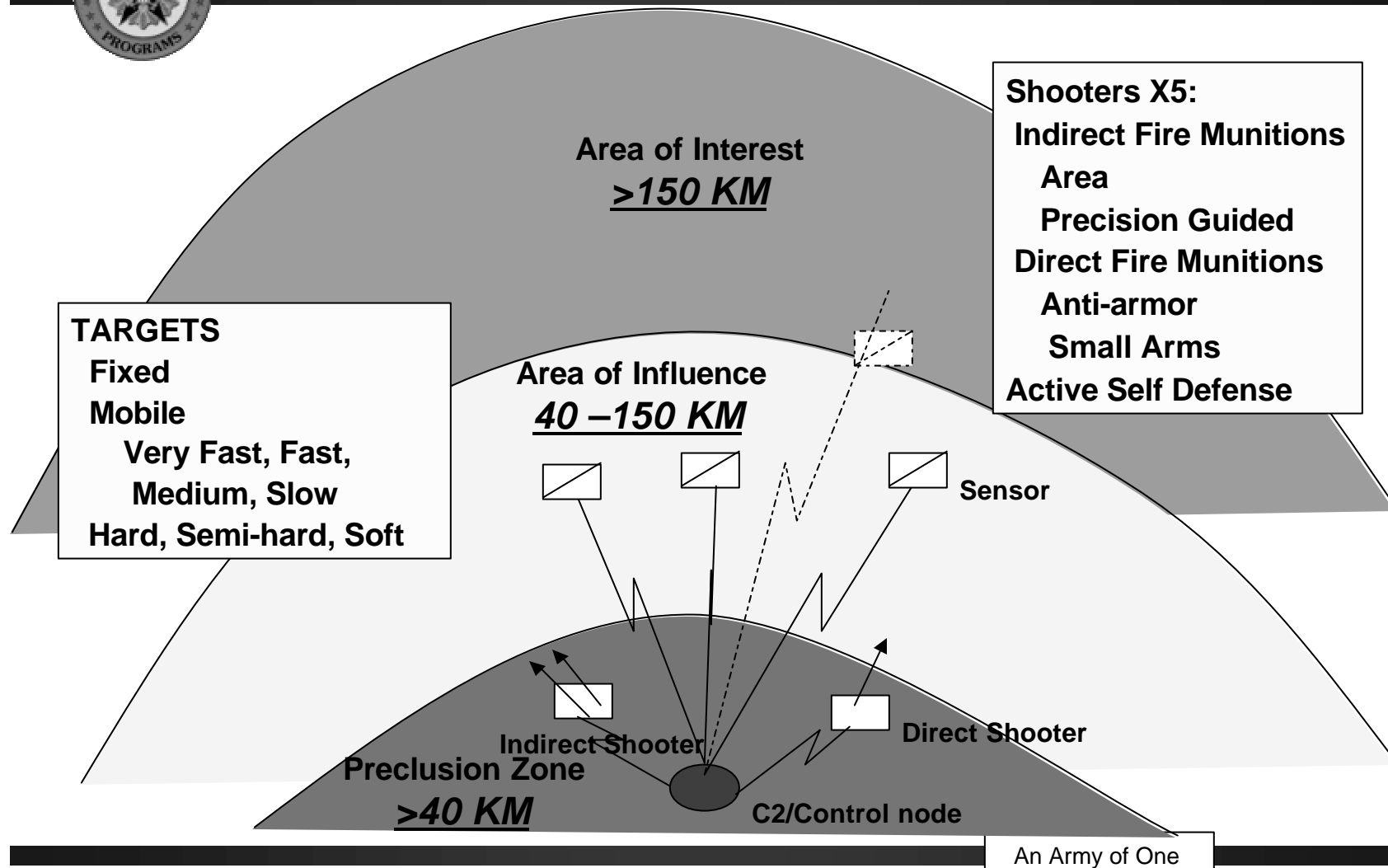
Fewer Army PGM requirements

JASSM
SLAM-ER
SFW
CEMs
LGBs
JDAM
JSOW
ATACMS IIA

An Army of One



Munitions Operational Context





Production Base

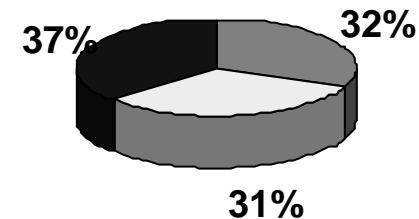
FY 1991

- 28 GOVERNMENT
- 163 CONTRACTORS
- 36 WITH GOV'T INVESTMENT

FY 2000

- 13 GOVERNMENT
- 69 CONTRACTORS
- 16 COCO W/GOV'T INVESTMENT

CAPACITY



To Be Disposed Disposed Retained

- BASELINE AUG 91

Organic Production Base

ACTIVE

IOWA, LONE STAR, MILAN	- LAP
RADFORD	- PROPELLANT
HOLSTON	- EXPLOSIVE
PINE BLUFF	- SMOKE
LAKE CITY	- SMALL ARMS
McALESTER	- BOMB
CRANE	- NAVY GUN & PYRO

ARMY RESERVE PLANTS

LOUISIANA	- PROJECTILE
RIVERBANK	- CTG CASES
MISSISSIPPI	- GRENADES
SCRANTON	- LARGE CAL

Approx 68% Capacity Reduction Since '91

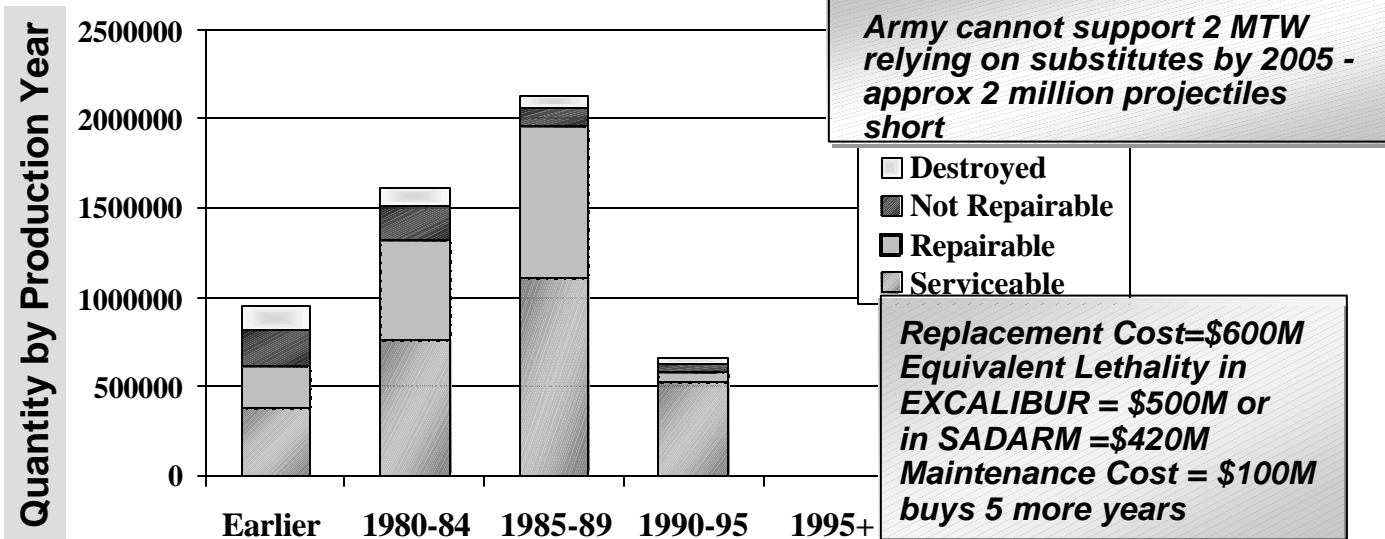
An Army of One



How Long Can We Rely on Aging Stockpile?

- Increasing signs of age in current stockpile - major suspensions in 60MM, Mechanical Time Fuzes, older 120MM tank ammunition
- Ongoing controversy on non-self destruct 'cluster munitions' may affect inventory of 4 million+ DPICM munitions and MLRS -potential \$22B bill to replace/remanufacture with Self-destruct fuzing
- Over \$100M in deferred maintenance on stockpile munitions - backlog growing

155MM DPIM
an example

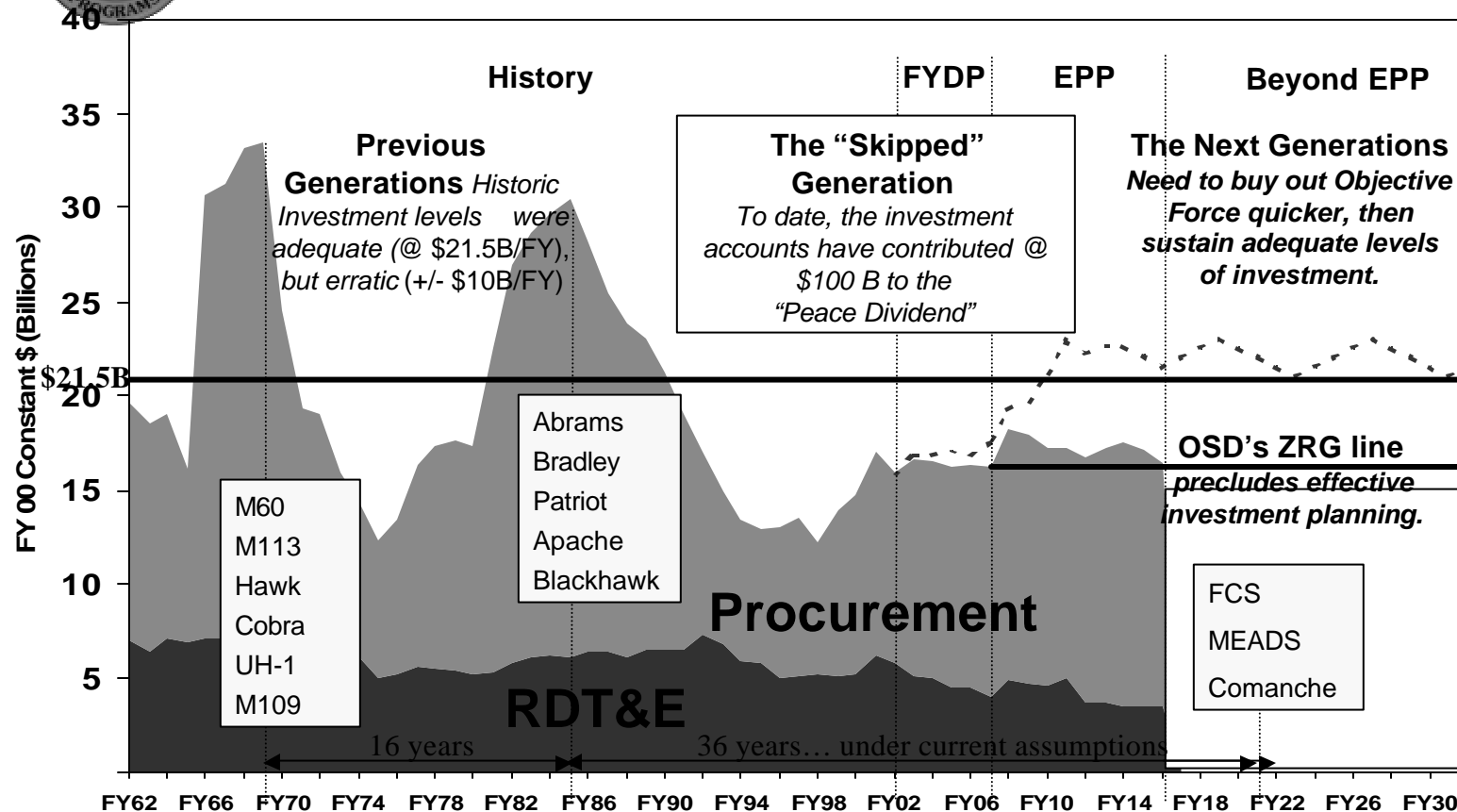


Army is facing need to recapitalize conventional munitions stockpile within next 10 years

An Army of One



Army RDA (1962-2032)

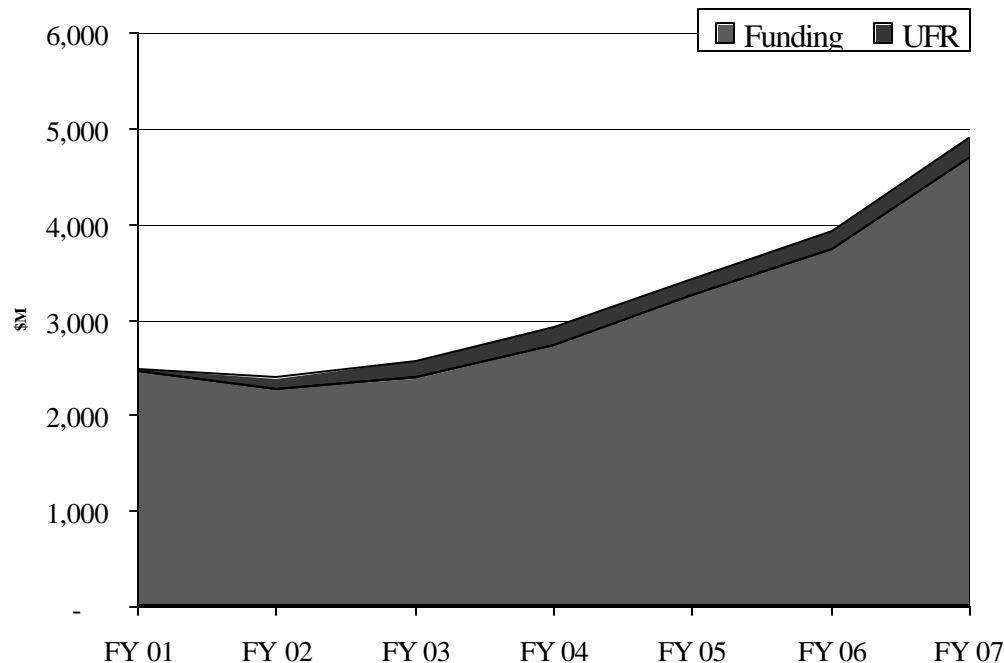


Future investment levels should be consistent with history (@ \$21.5B/FY), but cycles must be compressed and moderated to accommodate pace of technological change.

The Army cannot achieve the Objective Force without additional resources.



Objective Force



- Objective Force S&T and Modernization are funded at 99% FY01 and 95% average thereafter.
 - FY01 UFR = \$16M
 - FY02 UFR = \$118M
 - FY02-07 UFR = \$1.1B

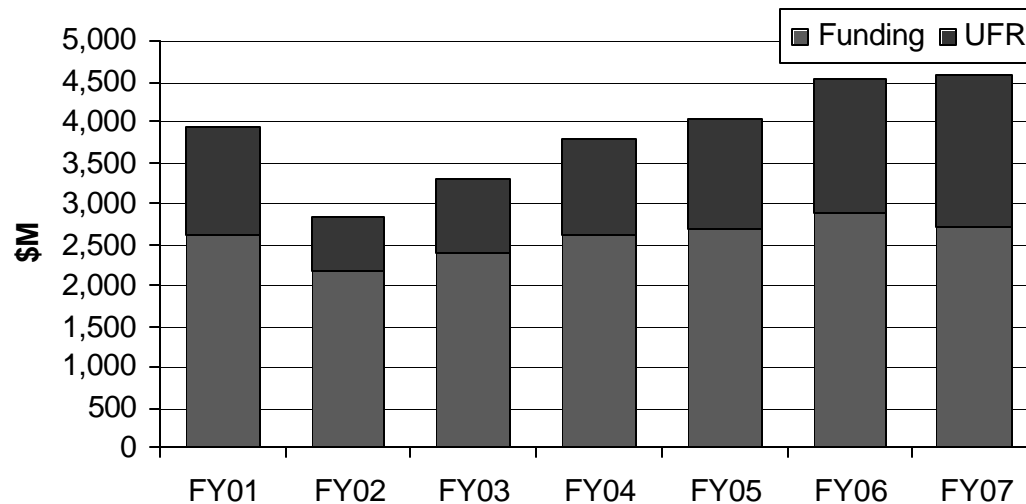
- Funds OBJ Force S&T at \$8.2B.
- Funds FCS S&T at \$3.2B.
- Funds \$1.3B for FCS Engineering Manufacturing Development.
- Assumes FCS production begins in FY08 and First Unit Equipped by the end of the decade.
- Funds Comanche First Unit Equipped in FY07.
- Funds WIN-T to provide bandwidth for the Objective Force.

The Objective Force will fundamentally change the way we fight.

An Army of One



Legacy Force Recapitalization



- Integrated Recapitalization is funded at 66% in FY01 and 67% average thereafter.

- FY01 UFR = \$1.4B
- FY02 UFR = \$643M
- FY02-07 UFR = \$7.5B

- 75% of major combat systems exceed their half life today. Available funding will not slow the aging of these systems.
- 21 Systems selected met age, readiness, and O&S cost criteria. Current funding only allows for the recapitalization of 16 of 21.

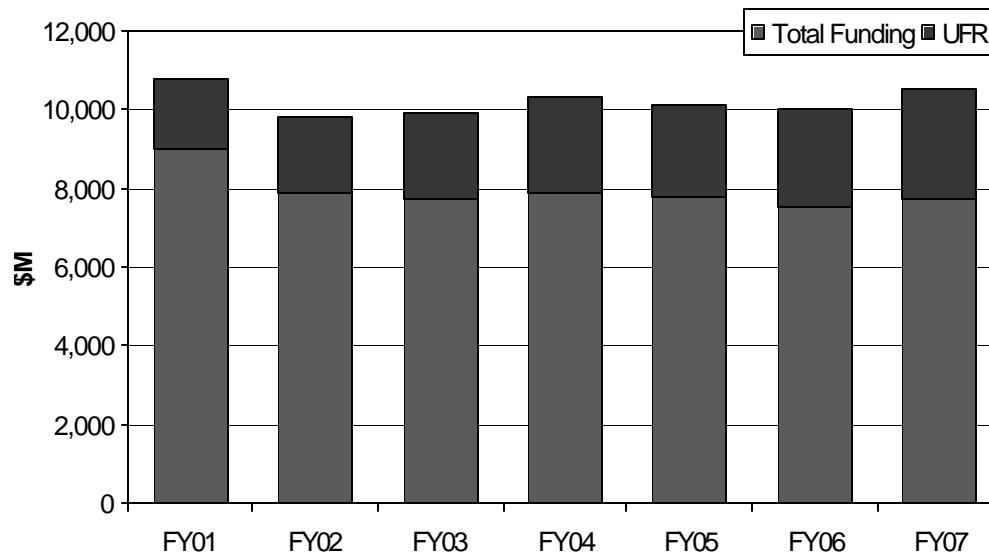
Recapitalization is a cost effective investment alternative to buying new and is critical to maintaining the Readiness of our Legacy Force as we transform.

An Army of One



Legacy Force

Selective Modernization



- Legacy Force Modernization is funded at 83% in FY01 and 77% average thereafter.

- FY01 Critical UFR = \$1.8B
 - FY02 Critical UFR = \$1.9B
 - FY02-07 Critical UFR = \$14.1B

- Legacy Force Modernization strategy defines three primary overmatch initiatives:

- Information Dominance
 - Enhancements to light unit lethality
 - Improvements to strategic responsiveness

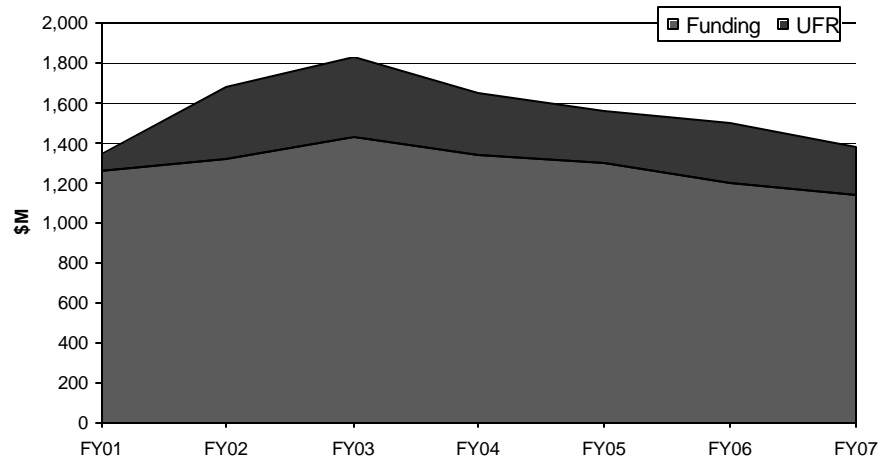
- Counterattack Corps has priority for Legacy Force modernization initiatives.

We must invest in selected systems that are essential to the Legacy Force's ability to execute the NMS while we transition to the Objective Force.

An Army of One



Interim Force



*GFE = Government Furnished Equipment

**ASIOE = Associated Support Item of Equipment

- Interim Force is funded at 94% in FY01 and 80% average thereafter.
 - FY01 UFR = \$78M
 - FY02 UFR = \$367M
 - FY02-07 UFR = \$1.9B

- IAV Costs are fully funded.

- Other IBCT Equip Costs are funded at 80% average FY02-07.
 - FY01 UFR = \$78M
 - FY02 UFR = \$100M
 - FY02-07 UFR = \$467M
 - GFE* and ASIOE** shortfalls will be addressed through reprioritization and reallocation

- IBCT Support Costs are funded at 32% average FY02-07.
 - FY02 UFR = \$267M
 - FY02-07 UFR = \$1.4B
 - Shortfalls will be validated and prioritized during POM 03-07 once IBCT conversion and fielding decisions are made

Provides near-term operational and warfighting capability to CINCs.

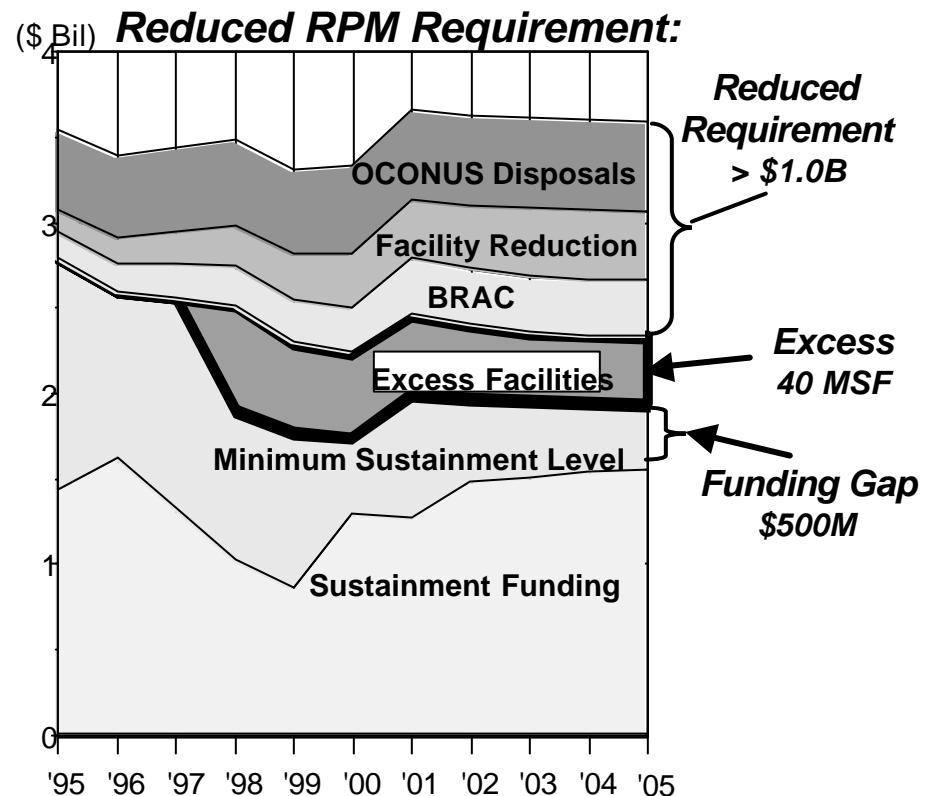
An Army of One



Reduced Requirement

Installation Efficiencies:

- **Base Realignment & Closure**
 - CONUS 112 Closures, 27 Realignments
 - \$944M annual savings
 - Disposal costs
- **Facility Reduction**
 - 100 MSF, FY92-03
 - \$400M annual cost-avoidance
- **Lease Reduction**
 - \$70M annual savings taken
- **Utility Privatization**
 - 320 systems examined by FY03
- **Energy Savings Performance Contracts**
 - 71 task orders
 - \$267.5M contractor investment
- **Family Housing Privatization**
 - 1820 units @ Ft Carson
 - Pending @ Hood, Lewis, Meade
- **Competitive Sourcing**
 - 61K spaces studied FY97-07
 - >\$800M in annual savings
- **Fund RPM only for required facilities**
 - No funding for Excess



Point: We're squeezing all the Efficiencies we can, ... but *Funding Gap* remains



Seven Characteristics of Full Spectrum Dominance

	Legacy Force		Interim Force	Objective Force
	Light	Heavy		
Responsive	R		R	R
Deployable	R		R	R
Agile		R(-)	R	R
Versatile	R(-)	R	R(-)	R
Lethal		R	R(-)	R
Survivable		R	R(-)	R
Sustainable		R(-)	R(-)	R

Responsive: the ability to put forces where needed on the ground.

Deployable: capable of rapid strategic movement.

Agile: the ability to shift seamlessly between military operations.

Versatile: adaptive to changing situations with utility across the spectrum.

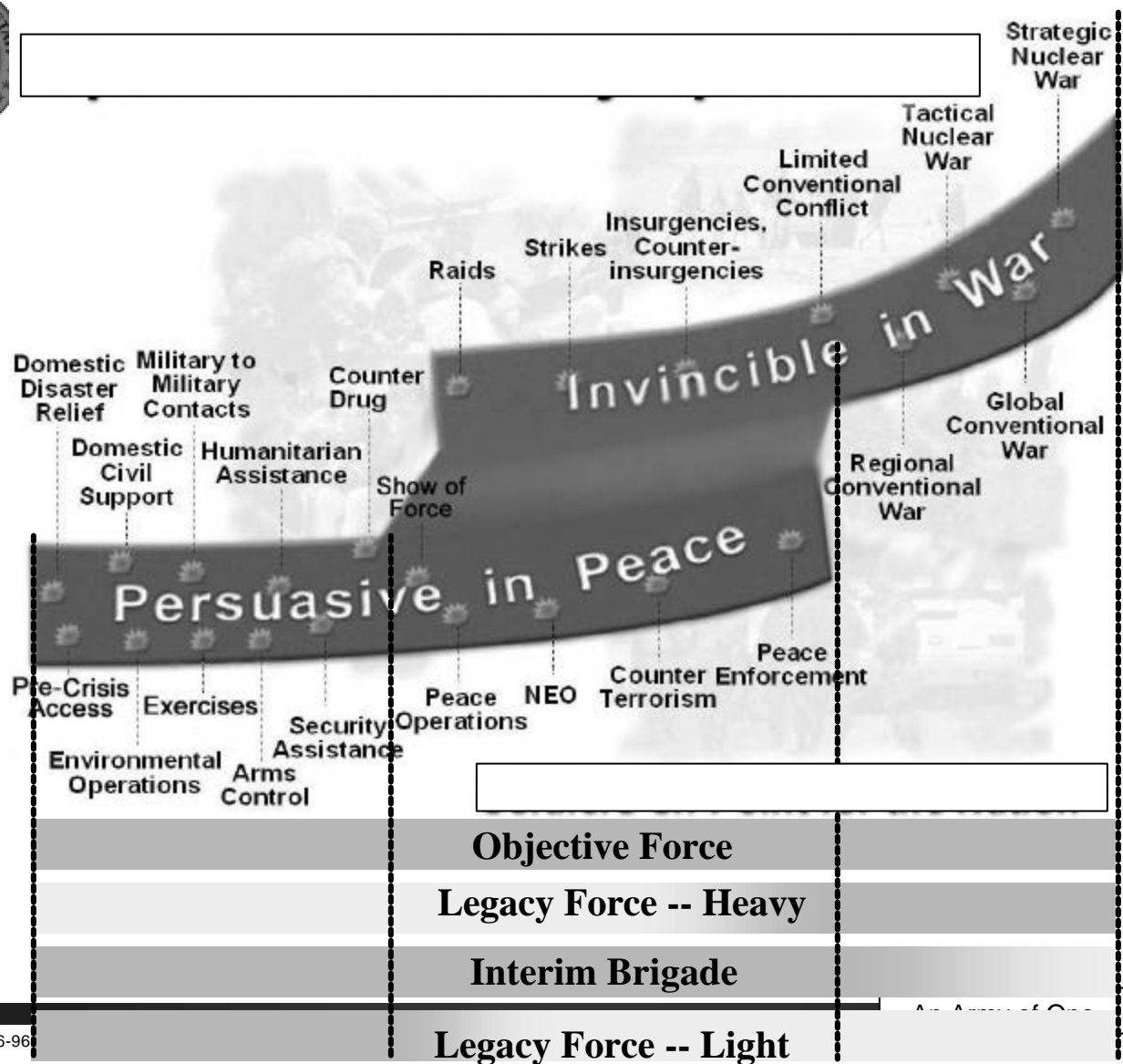
Lethal: the overwhelming ability to win through the application of force.

Survivable: measures to protect the force in combat and against asymmetric threats.

Sustainable: the capability to continue operations longer than any adversary.

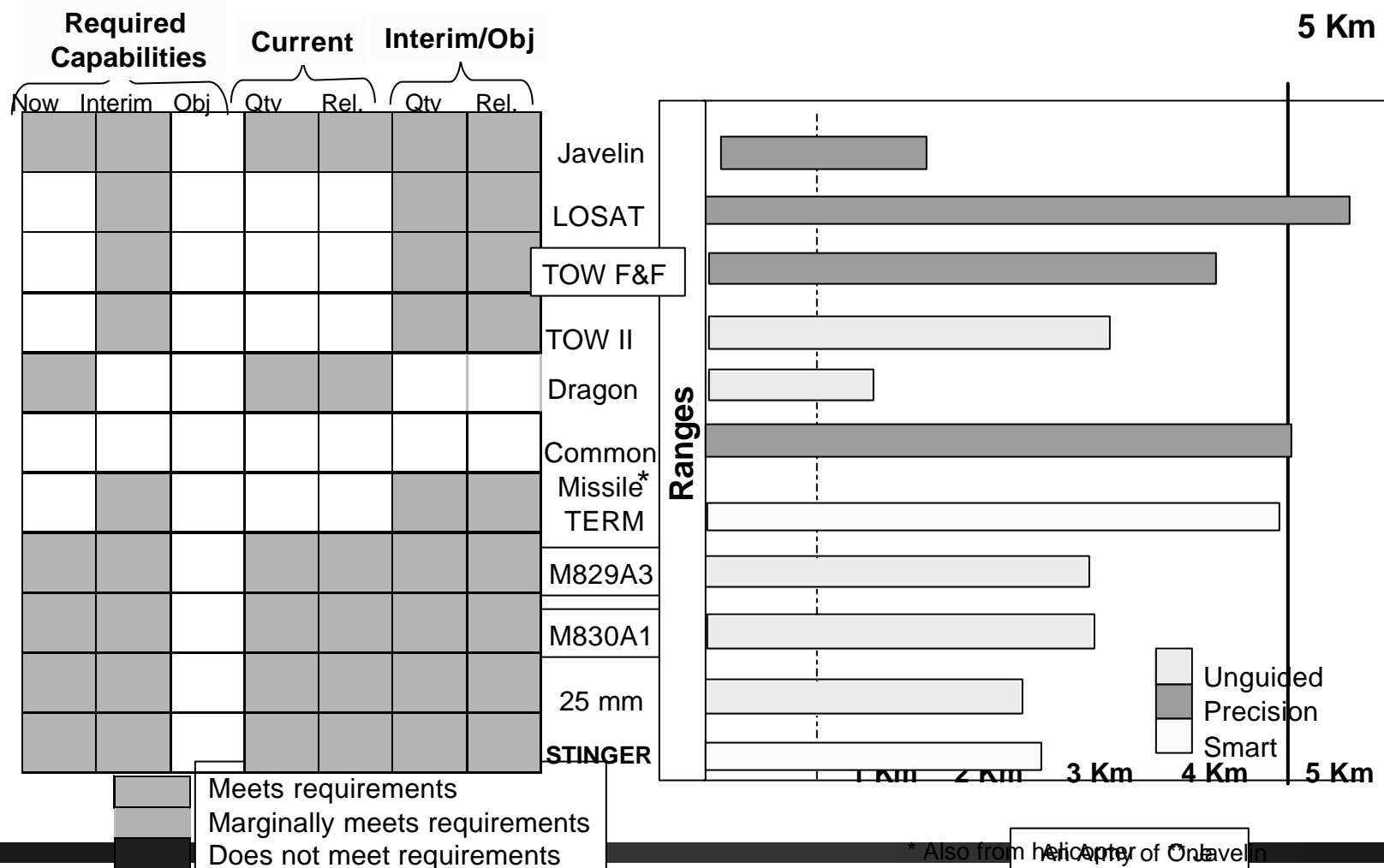
An Army of One

Matching Capabilities to Operations



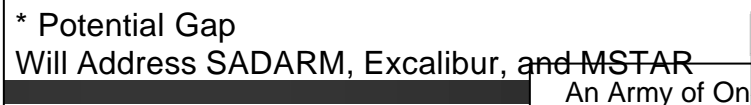


The Warfight - Close Fight





DPICM
HE ER
RADAM
SMART
EXCALIBUR
DPICM
HERA
GMLRS
Unitary
GMLRS
MSTAR
MLRS
MLRS - ER



02/26/2001 RHC/ F

Meets requirements
Marginally meets requirements
Does not meet requirements

Unguided
Precision
Smart



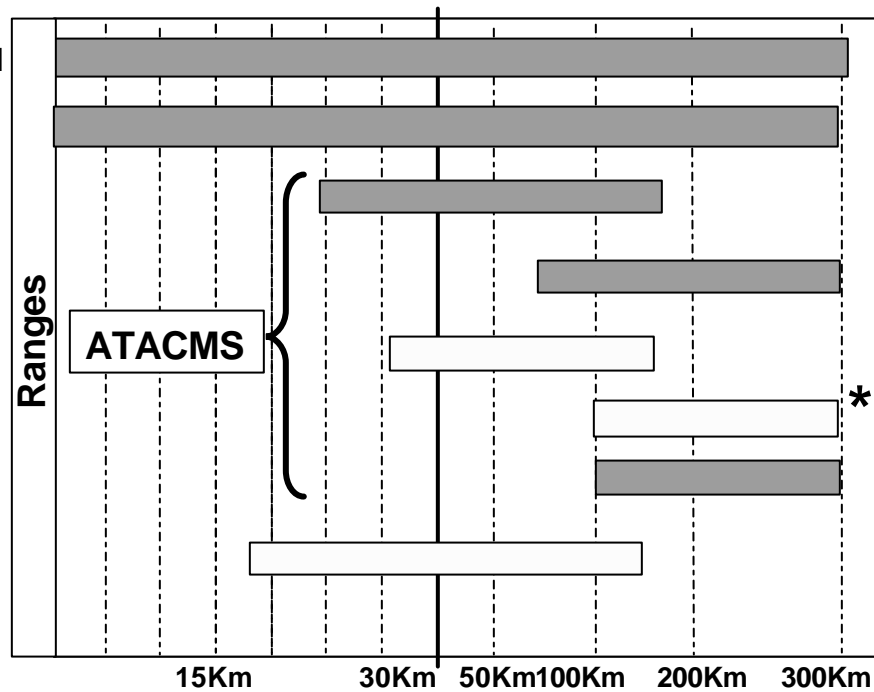
The Warfight - Deep Battle

Required Capabilities			Now		Interim/Obj		
Now	Interim	Obj	Qty	Rel.	Qty	Rel.	
Meets	Meets	Meets	Meets	Meets	Meets	Meets	Hellfire II
Meets	Meets	Meets	Meets	Meets	Meets	Meets	Common Missile
Meets	Meets	Meets	Meets	Meets	Meets	Meets	BLK I
Meets	Meets	Meets	Meets	Meets	Meets	Meets	BLK IA
Meets	Meets	Meets	Meets	Meets	Meets	Meets	BLK II
Does not	Does not	Does not	Does not	Does not	Does not	Does not	BLK IIA
Meets	Meets	Meets	Does not	Does not	Meets	Meets	Unitary
Meets	Meets	Meets	Meets	Meets	Does not	Does not	PAC2/3

Meets requirements	
Marginally meets requirements	
Does not meet requirements	

*

- Can Army afford?
- Joint requirements (I.e. all weather, survivable, etc)

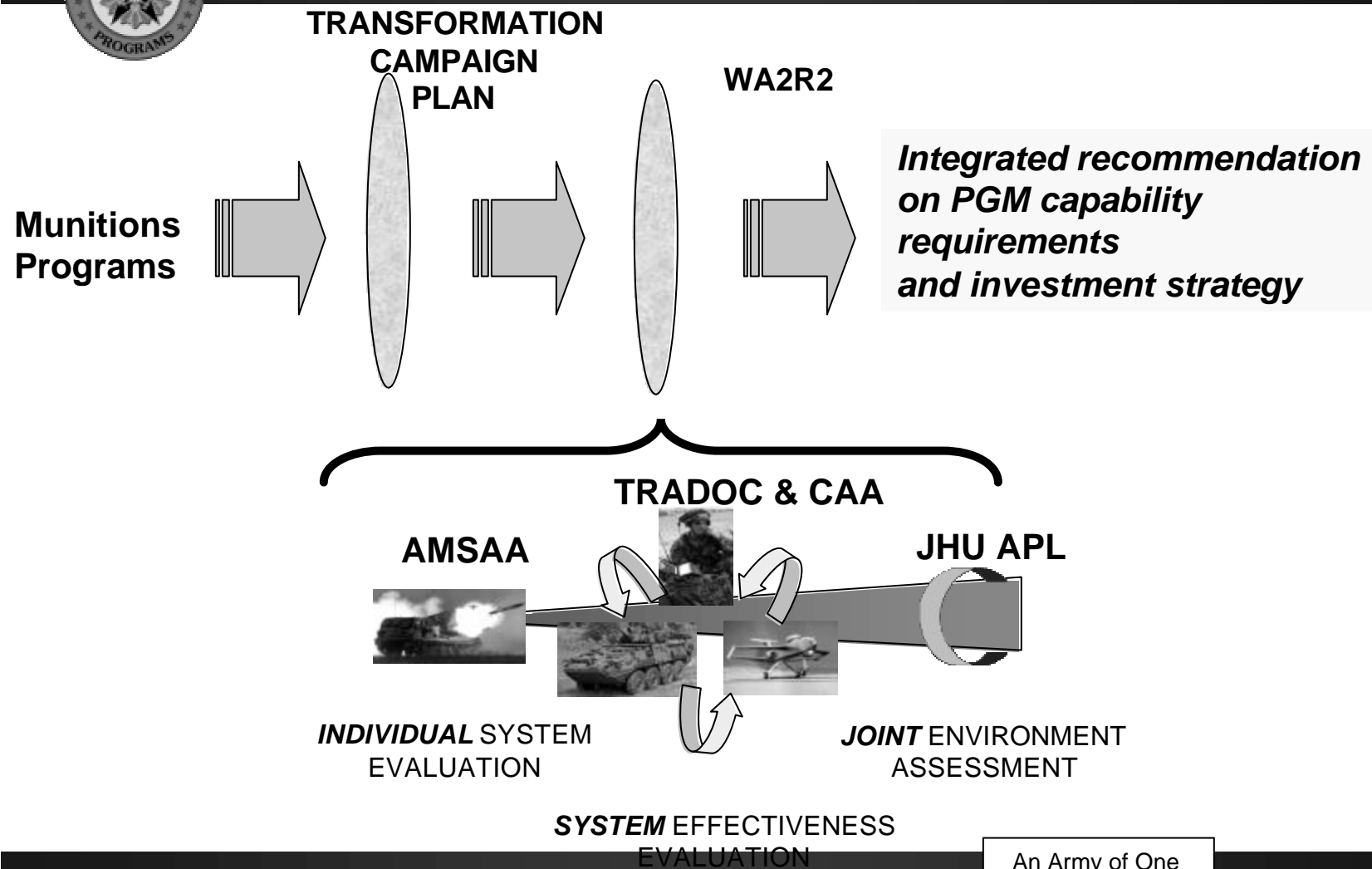


Unguided	
Precision	
Smart	

An Army of One



Integration of WA2R2 Results





Low Cost Competent Munitions 1-D Corrector

Description

Corrects predominant delivery error - range

–Uses Global Positioning System (GPS)

–Drag Control Brake on Fuze Corrects for Range Error

Fits into Standard Fuze Well of 105mm and 155mm Howitzers

Current Status

United Kingdom is Developing a 1-D System
1-D Corrector Technology Tested at Yuma
Proving Ground

Remaining R&D Efforts

One Year Tech Base: Engineering- Closed Loop
Demo/Simulation
EMD: System Integration

Cost

RDTE - \$13 Mil (assumes Joint US/UK program)
Unit Cost: \$1500 (200K units produced)

Time to IOC

5 yrs FY05 (Assumes Funding in FY02)

Technical Risk Low - Medium

Benefits

Increases Effectiveness of Legacy Stockpile

– Both ICM and HE

Significantly Reduces Requirements

Provides Earlier Kills with Fewer Rounds

Increases Soldier Survivability

Reduces Logistic Burden

Technology Supports Future Combat System

Reduces Collateral Damage

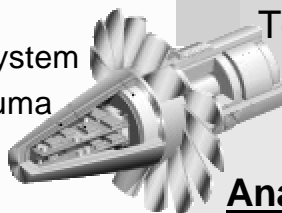
Analysis Underway

Work with CAA on Reworking Requirements
TAA07 Using Excalibur - Unitary in lieu of
Excalibur - DPICM

Use Specific Improvement Ratios for Each
Round to Develop Cost Savings due to reduced
Requirements with 1-D Corrector

Develop Savings Due to Reduced Logistics -
Tonnage, Prop Charges, etc.

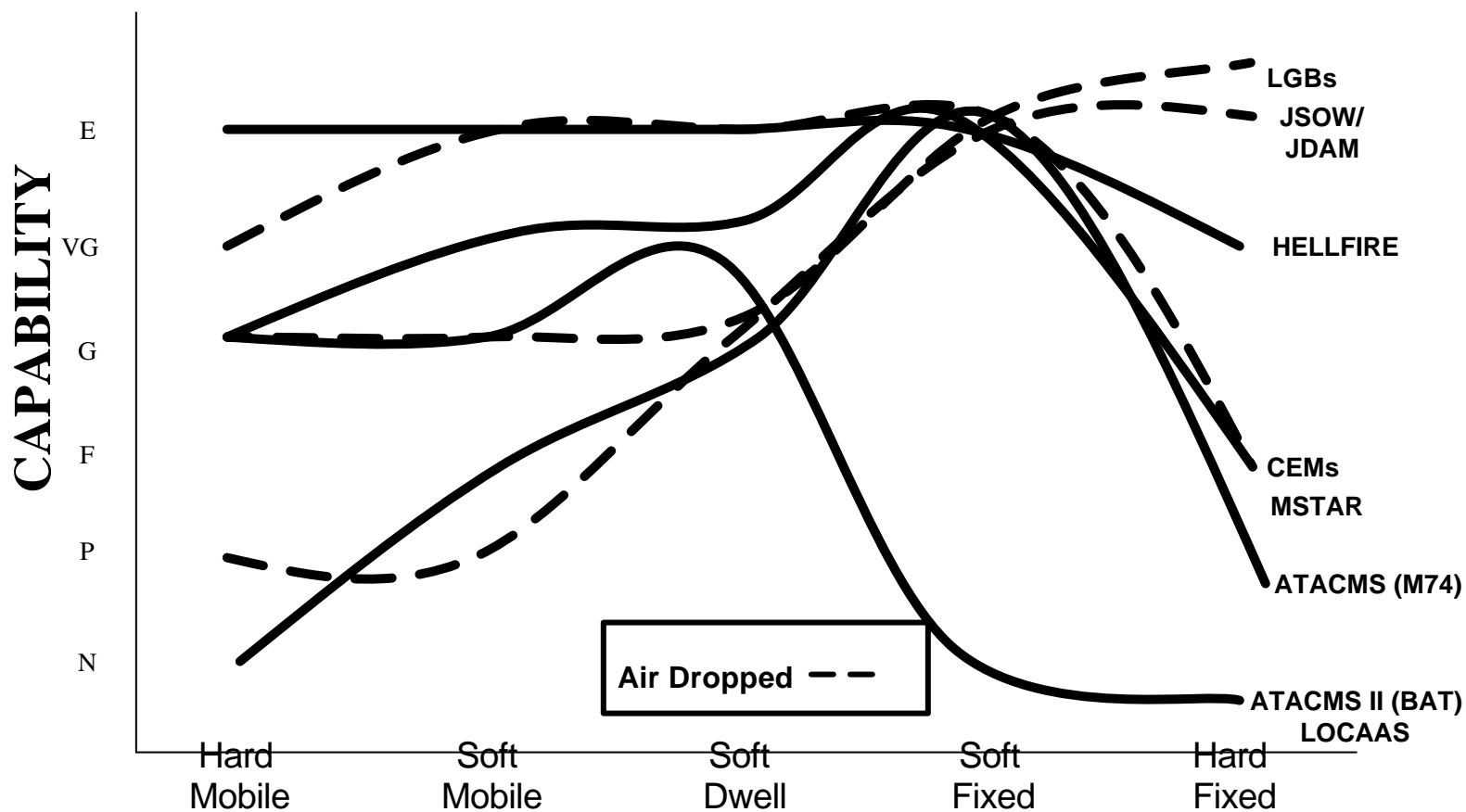
Work with FT Sill on comparing CINC
OPLANwith TAA07 Requirements





Effectiveness Tradeoff

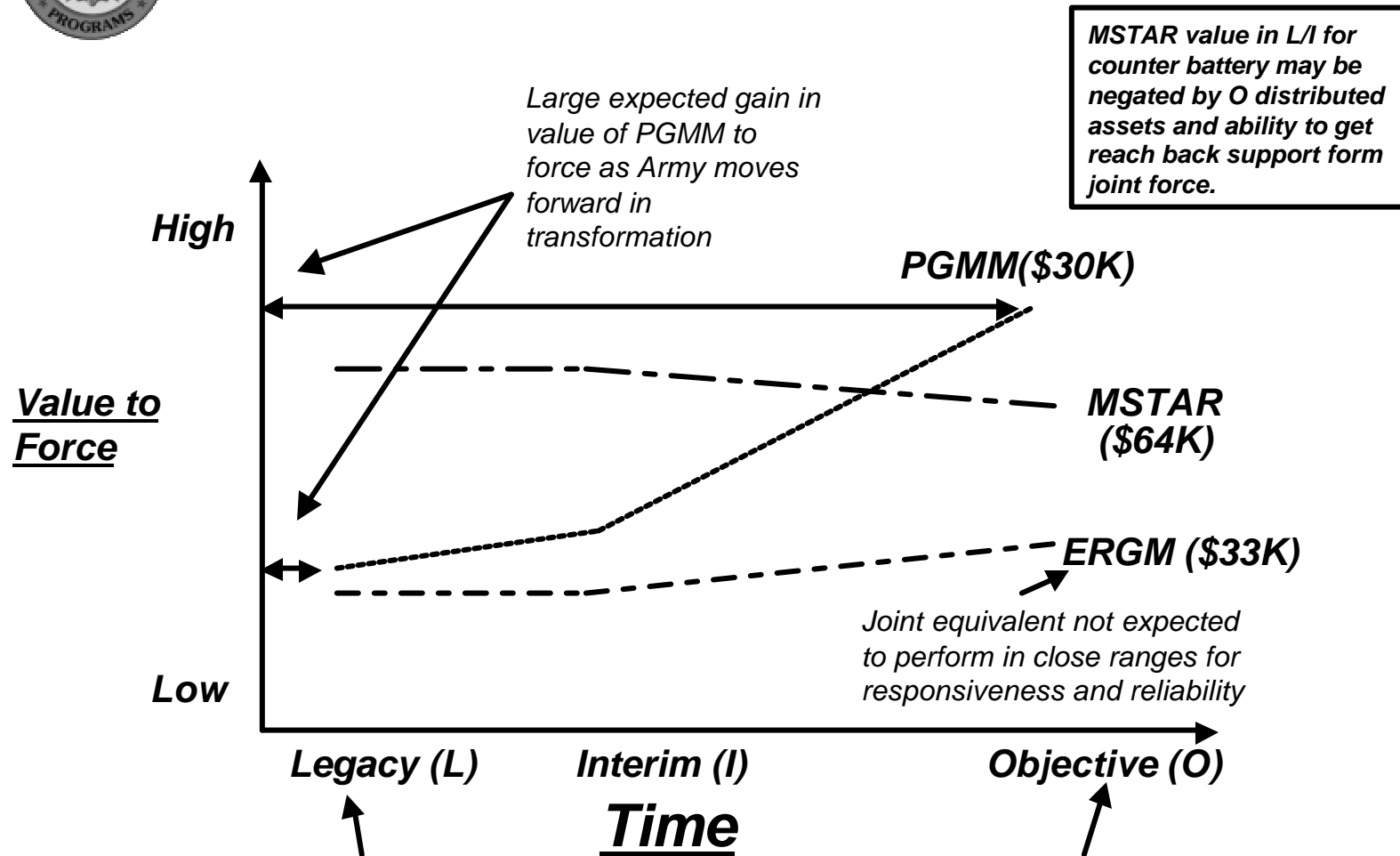
Ranges 40km – 150km



An Army of One



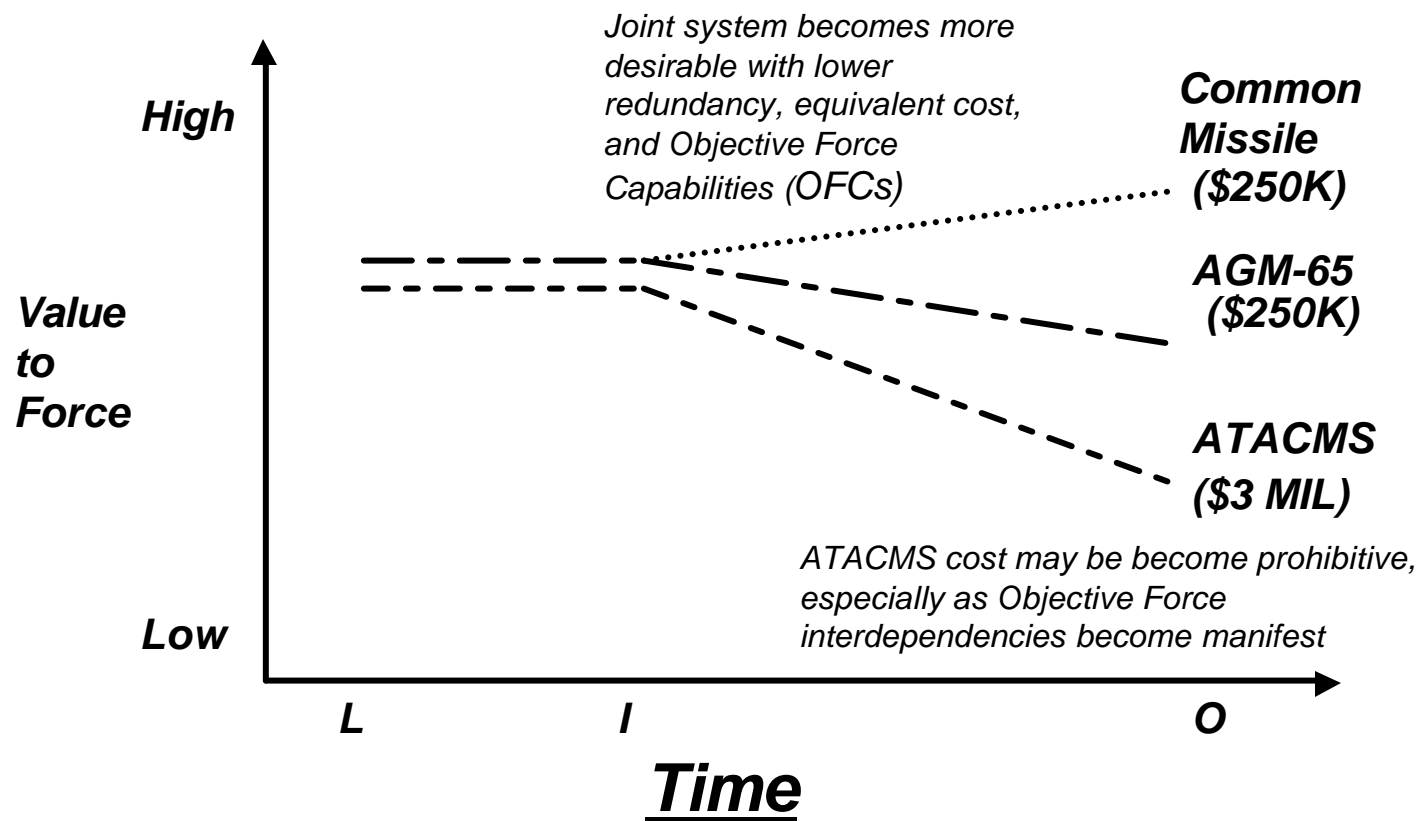
< 40 Kilometers



Significant change in CONCEPT of OPS between L /I and O



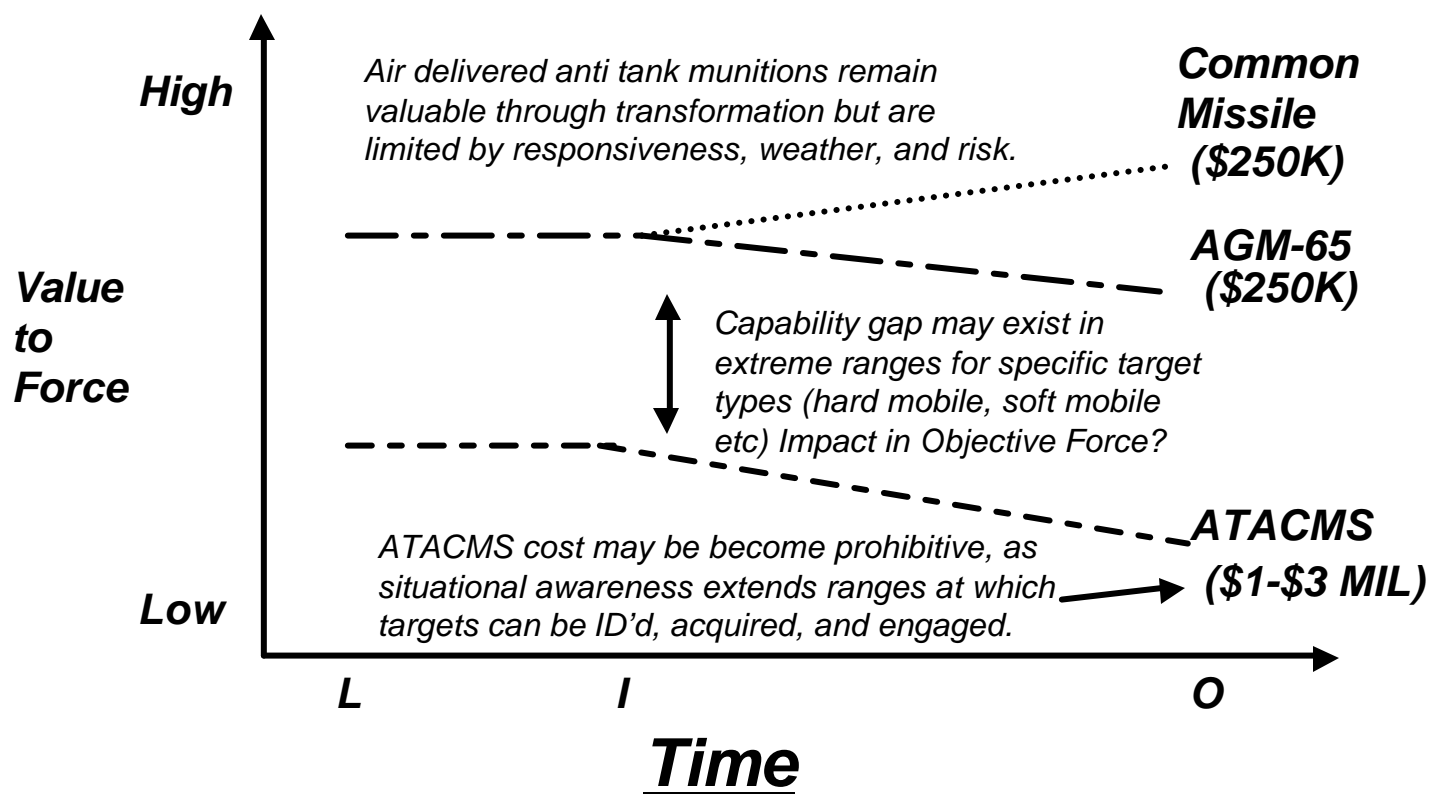
40 - 150 Kilometers



An Army of One



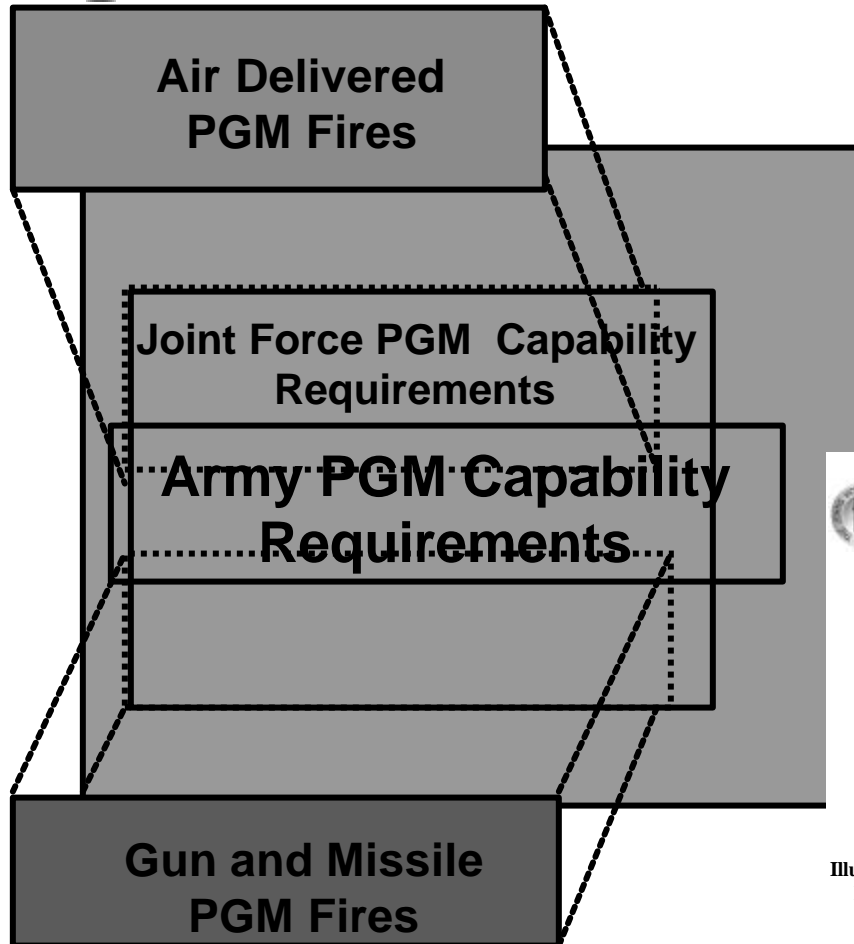
> 150 Kilometers



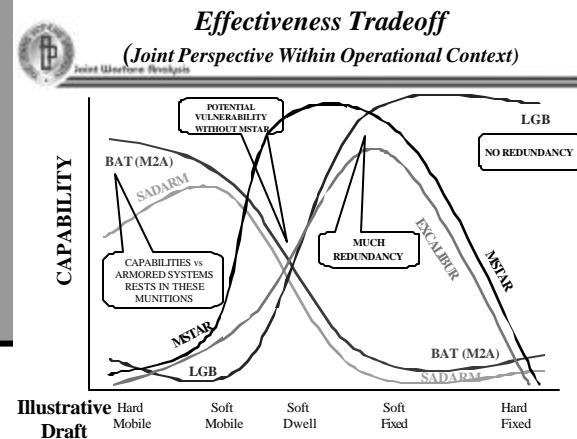
An Army of One



So....In an Operational Domain, What Army PGM Capability Redundancies are Essential?



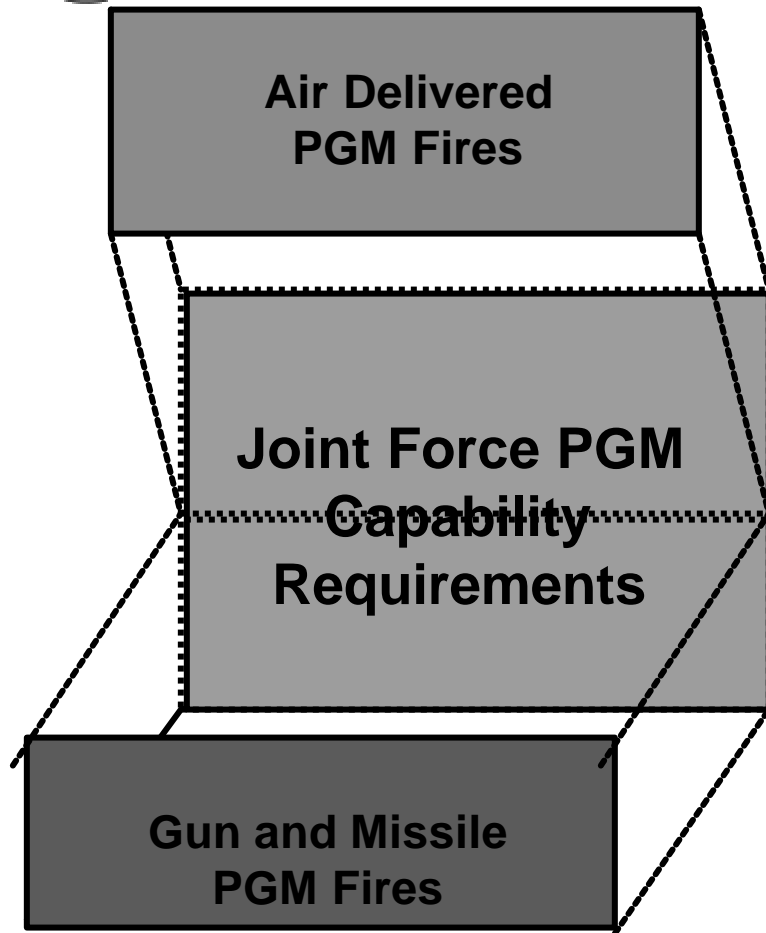
- What missions are single point of failure?
- How can the Army leverage Joint Force PGM capability interdependencies?



An Army of One



But....In a Fiscal Environment, What Army PGM Capability Redundancies Are Affordable?



- What missions is it best suited to perform as force characteristics change over time?
- How can the Army leverage Joint Force PGM capability interdependencies?

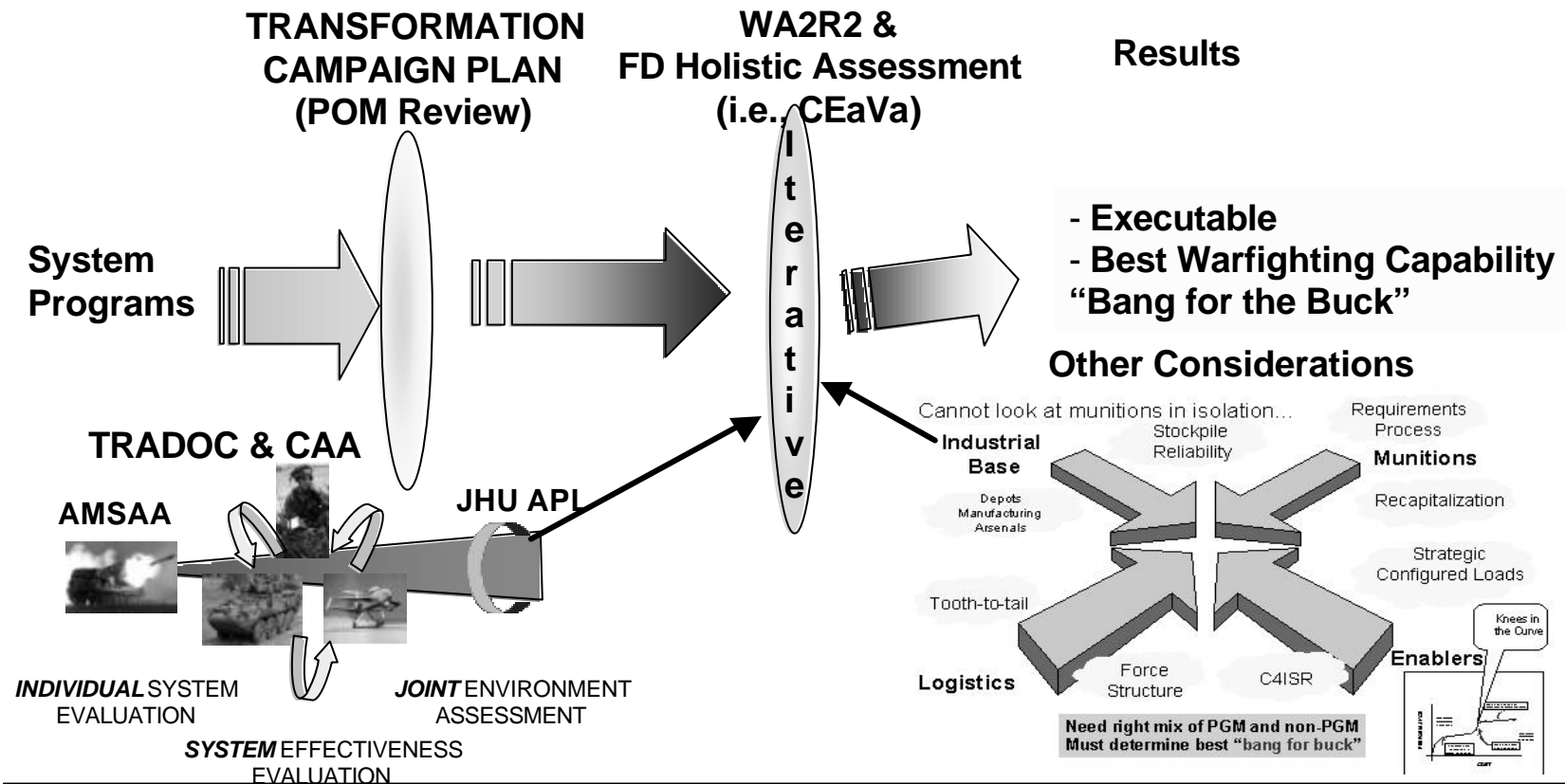


An Army of One

FD Integration Provides Insight Into Complex Issues



Warfighting Alternative Analysis and Requirements and Resource (WA2R2) Study Mission

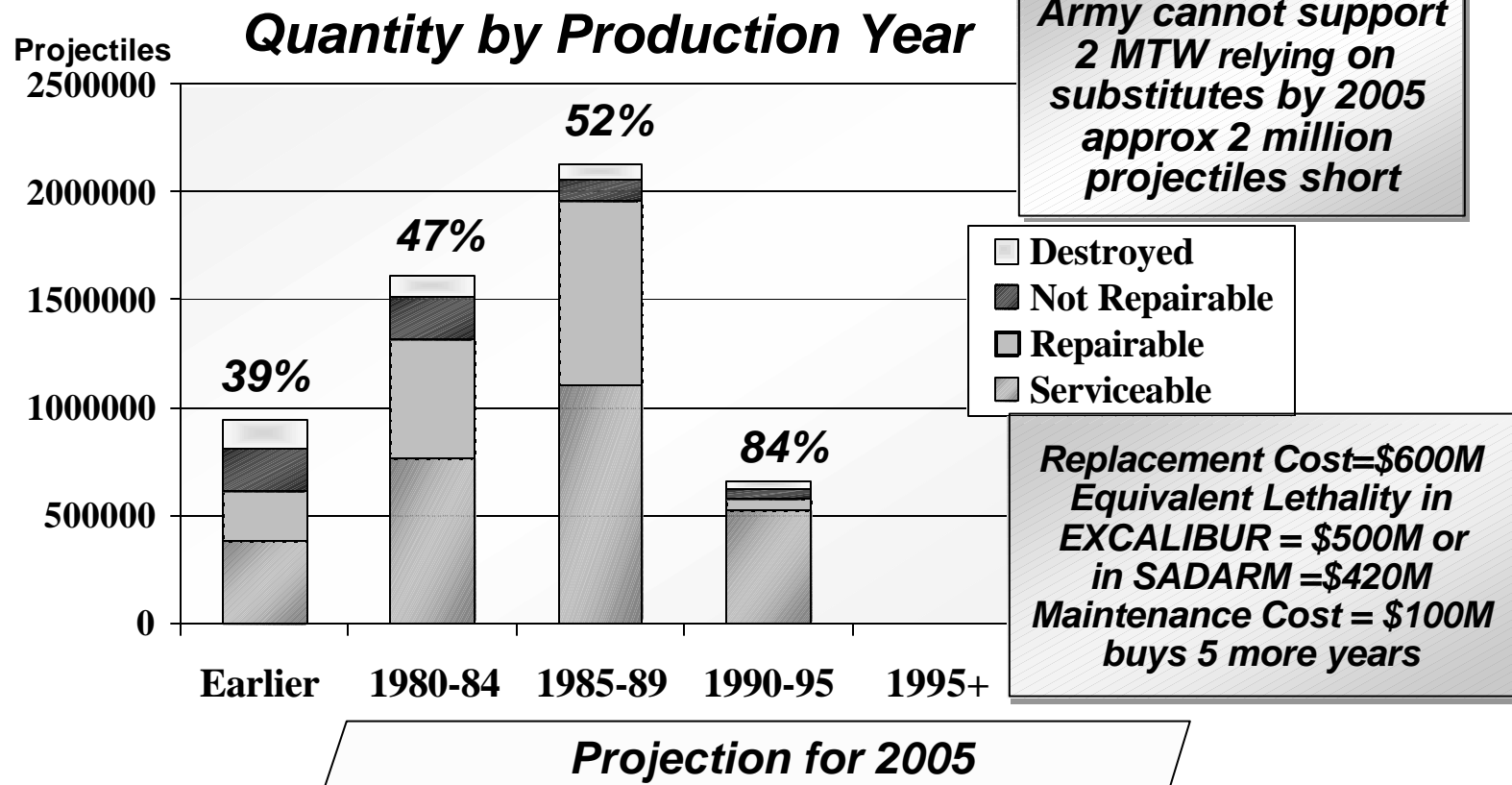


- Conduct integrated holistic analysis to determine required Land Force capabilities to be resourced to meet vision.
- Determine cost effective (best family frontier and priorities) for the Army's Senior Leadership for 03-07 POM and QDR.



Aging Stockpile - 155MM DPICM

Primary warfight munition for artillery until SADARM and EXCALIBUR fully field



An Army of One



Legacy Force Mod & Recap

The Counterattack Corps & Non-Counterattack Corps

Counterattack Corps



III Corps 1CD 4ID 3ACR



FY03 Decision

IBCT



3-2ID 1-25 ID

RECENT DCSOPS
DECISION
ELEVATED 2ID
PRIORITY



2ID



V Corps



1AD (-)



1ID (-)



172 IN



25 ID

Non-Counterattack Corps



XVIII
Corps



3 ID



82 Abn



101 Abn



1-1 ID



3-1 AD

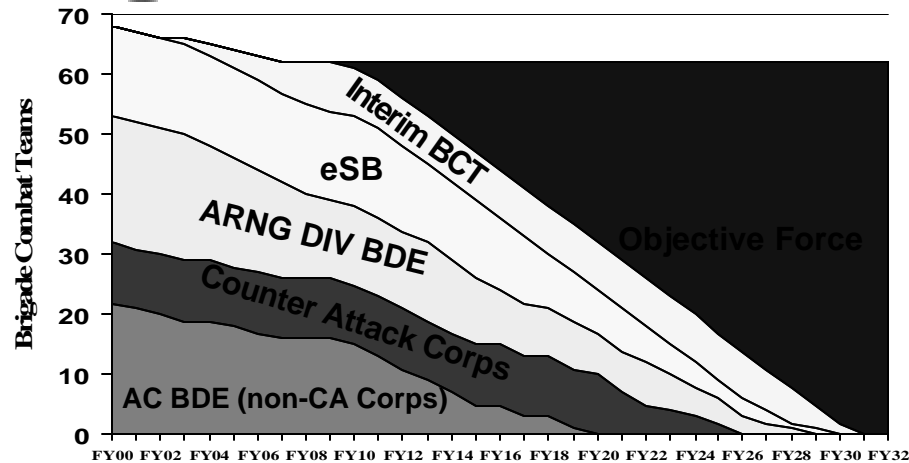
Non-Counterattack Corps – Forward Deployed

Limited recapitalization – mostly rebuild

An Army of One



Legacy Force Modernization



- ✓ Selectively Modernize Legacy Force units
- ✓ Focused on Counterattack Corps
- ✓ Investment strategy is to focus on modernization programs that migrate to Objective Force

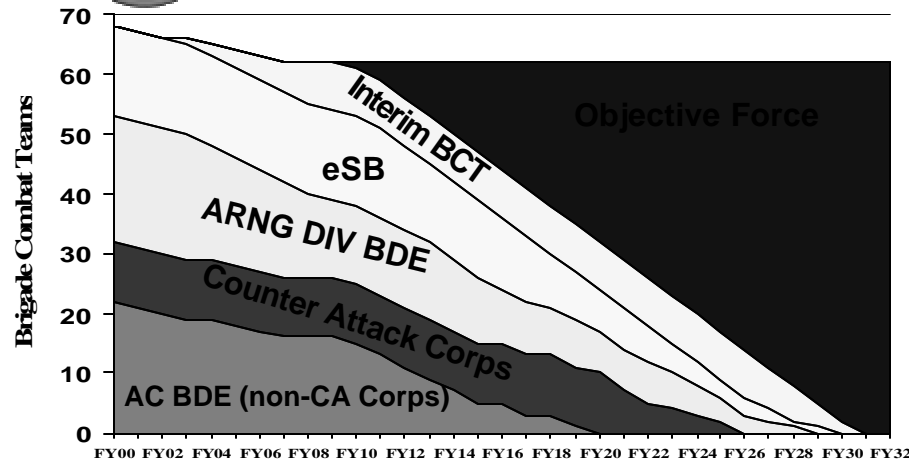
SELECTED MODERNIZATION PROGRAMS

- Comanche
- ABCS
- WIN-T
- HIMARS
- Javelin
- FMTV
- Crusader
- MEADS
- THAAD

An Army of One



Legacy Force Recapitalization



- ✓ Recapitalize selected Legacy Force units
- ✓ Priority is to Counterattack Corps & aligned reserve component CS & CSS units
- ✓ Limited recap of non-CATK force
- ✓ Cannot afford to recapitalize entire Legacy Force – AC & RC

SELECTED RECAPITALIZATION PROGRAMS

21 of 31 Systems

SELECTED UPGRADE

- M1A2 SEP
- AH-64D
- M2A3
- UH-60M
- CH-47F
- M270A1
- HERCULES
- HEMTT ESP
- D7 DOZER
- M113A3
- M915A4
- AVLB

REBUILD

- M1A1D
- M1A1 AIMXXI
- M2A2 / ODS
- UH-60A
- M9 ACE
- M88A1
- PATRIOT
- HEMTT
- SEE
- FIREFINDER
- FAASV
- CH-47D

An Army of One



Emerging Insights

Modeling and analysis focus is on Legacy Force. Interim and Objective Force should drive “future” munition developments.

As ranges from targets increase, joint interdependency opportunities expand with regard to risk (single point of failure). This can provide trade space for munitions program decisions in support of transformation goals. Perspective of PGM value varies with time and force employment concepts.

A2R2 study provides description of Legacy MTW; Best family mix may not satisfy Interim or Objective Force programming lead times if used as basis for POM decisions. Joint munitions contributions are not fully portrayed. Interim and Objective force employment is not addressed.

PGM Redundancy (both pure Army and Army / Joint) at different range bands offers targeted budgetary trade space opportunities that are consistent with Transformation goals.

There are PGM's with single point of failure potential value; particularly in the <40 KM range area..